

Fig. 1
Prior Art

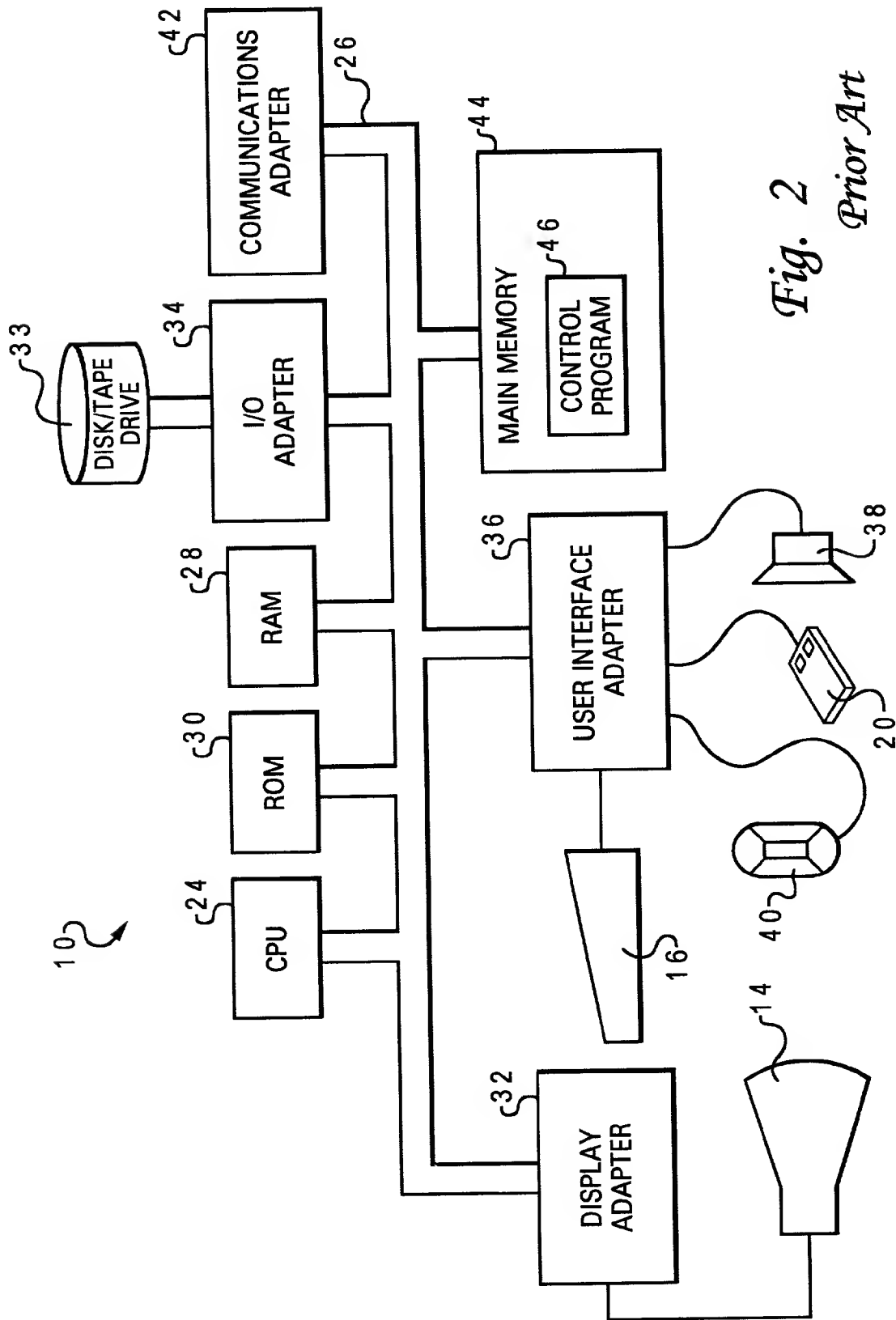


Fig. 2
Prior Art

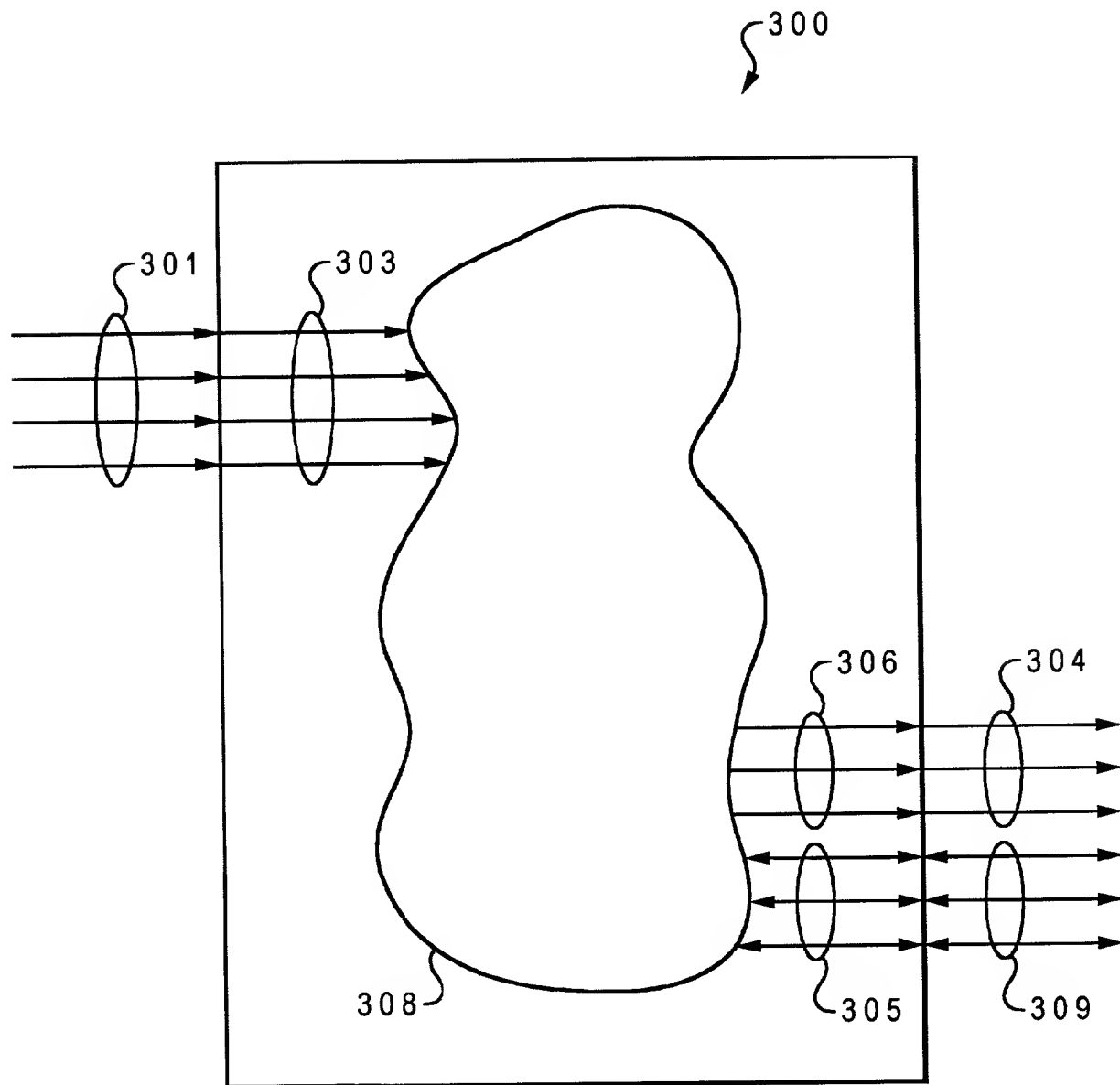


Fig. 3A

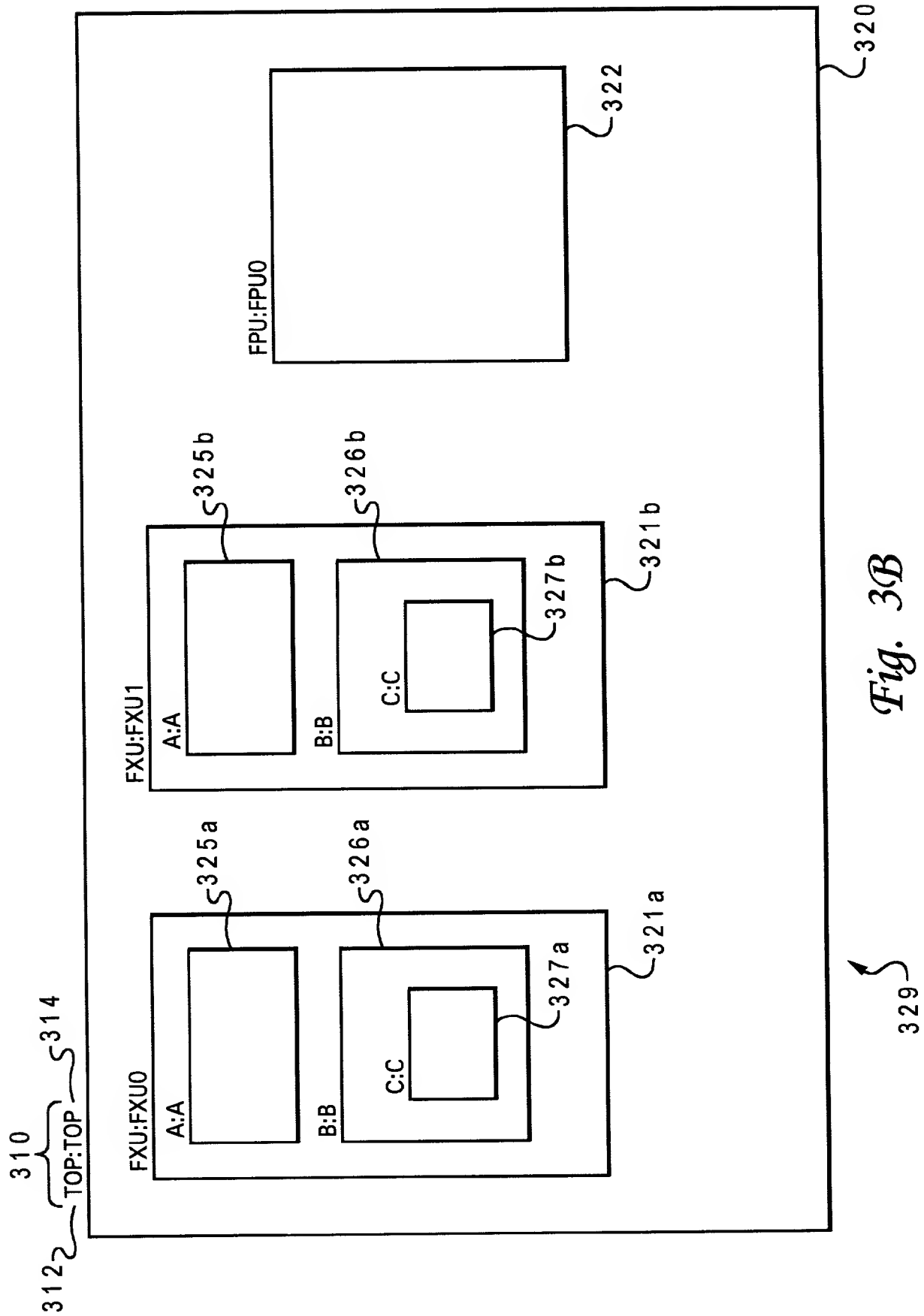


Fig. 3B

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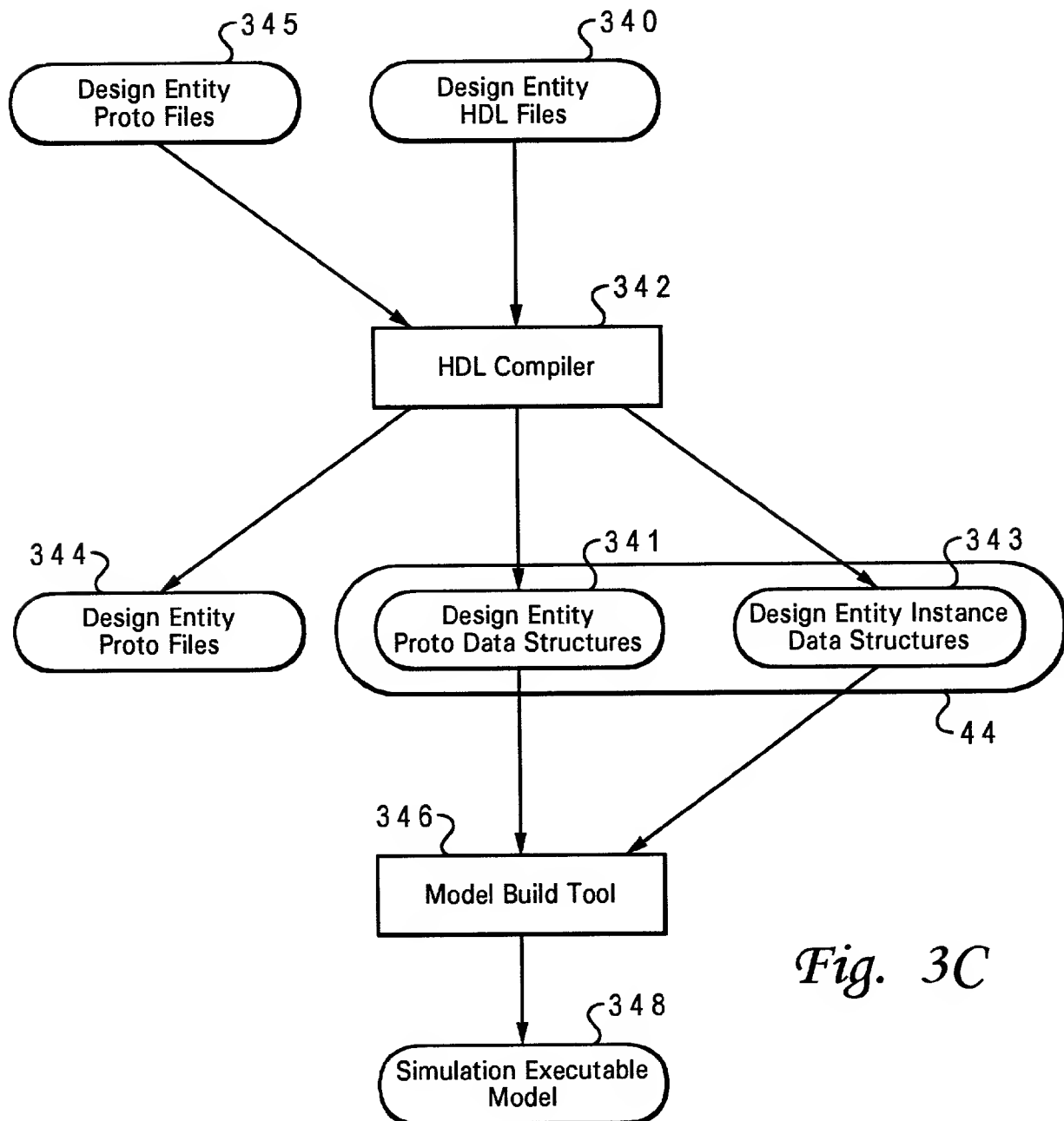


Fig. 3C

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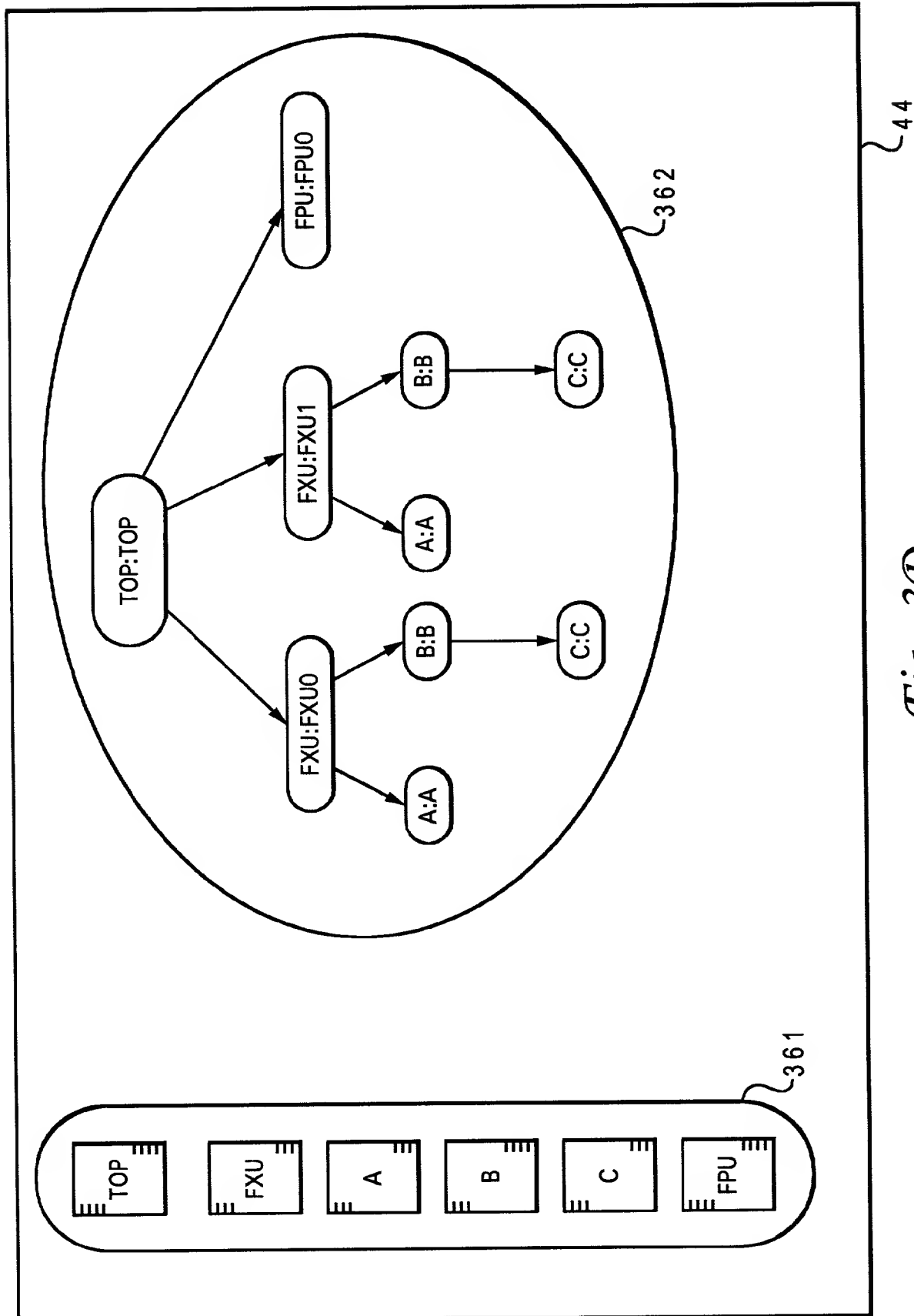


Fig. 3D

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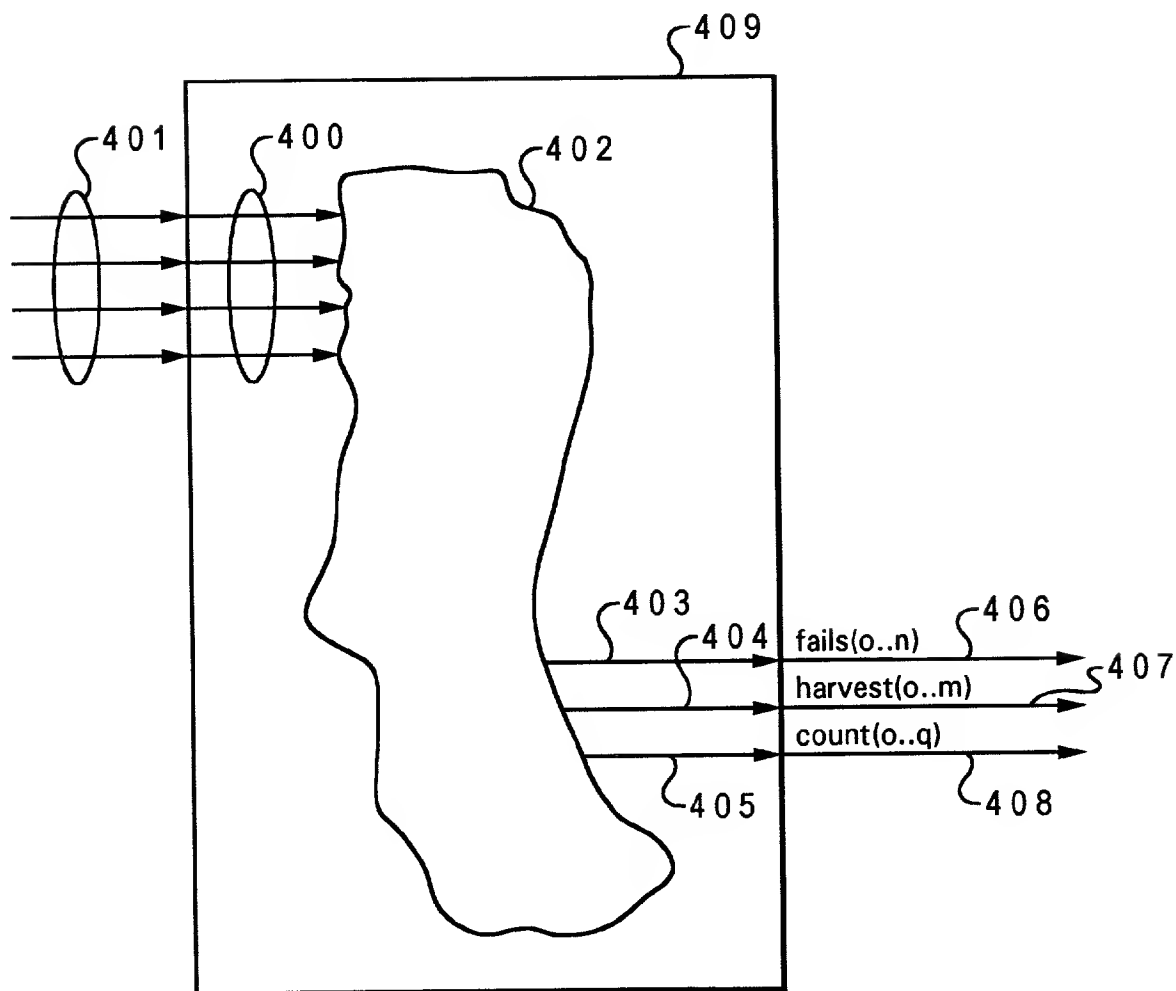


Fig. 4A

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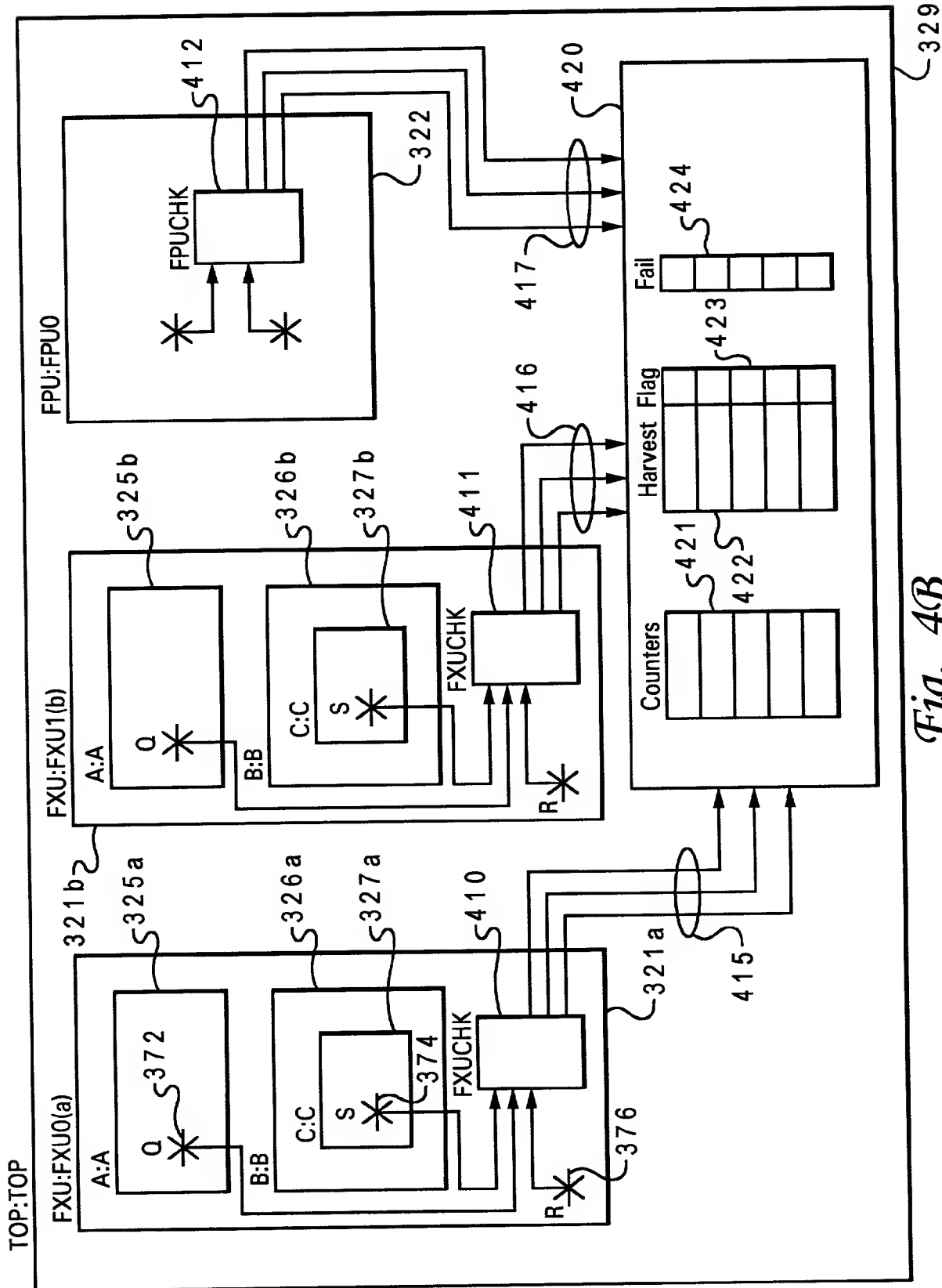


Fig. 4B

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ENTITY FXUCHK IS

```

PORT(  S_IN      :  IN std_ulogic;
        Q_IN      :  IN std_ulogic;
        R_IN      :  IN std_ulogic;
        clock     :  IN std_ulogic;
        fails     :  OUT std_ulogic_vector(0 to 1);
        counts    :  OUT std_ulogic_vector(0 to 2);
        harvests  :  OUT std_ulogic_vector(0 to 1);
);

```

4 5 0

4 5 2 { --!! BEGIN
--!! Design Entity: FXU;

4 5 3 { --!! Inputs
--!! S_IN => B.C.S;
--!! Q_IN => A.Q;
--!! R_IN => R;
--!! CLOCK => clock;
--!! End Inputs

4 5 4 { --!! Fail Outputs;
--!! 0 : "Fail message for failure event 0";
--!! 1 : "Fail message for failure event 1";
--!! End Fail Outputs;

4 5 1

4 5 5 { --!! Count Outputs;
--!! 0 : <event0> clock;
--!! 1 : <event1> clock;
--!! 2 : <event2> clock;
--!! End Count Outputs;

4 5 6 { --!! Harvest Outputs;
--!! 0 : "Message for harvest event 0";
--!! 1 : "Message for harvest event 1";
--!! End Harvest Outputs;

4 5 7 { --!! End;

4 4 0

ARCHITECTURE example of FXUCHK IS

BEGIN

... HDL code for entity body section ...

END;

4 5 8

Fig. 4C

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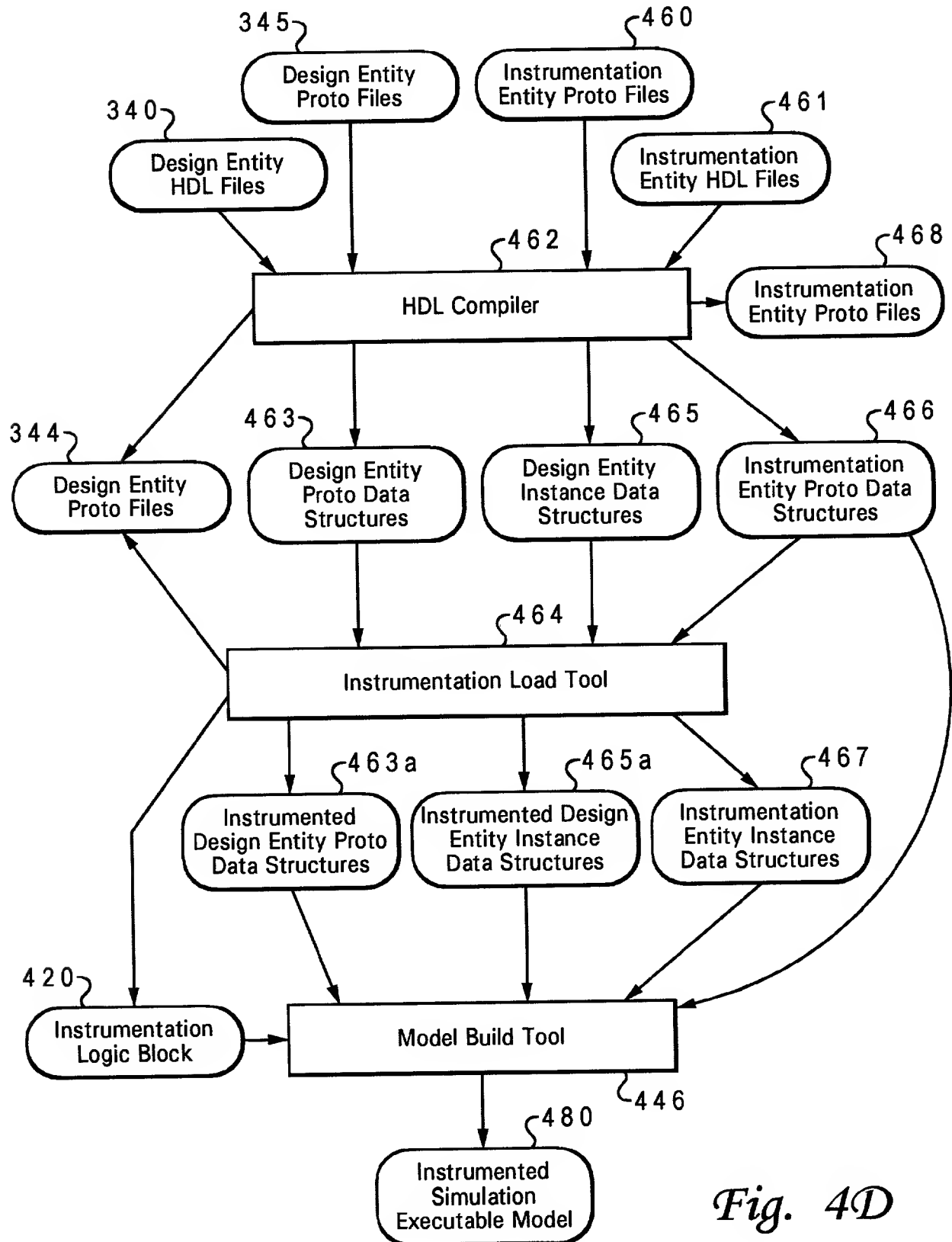


Fig. 4D

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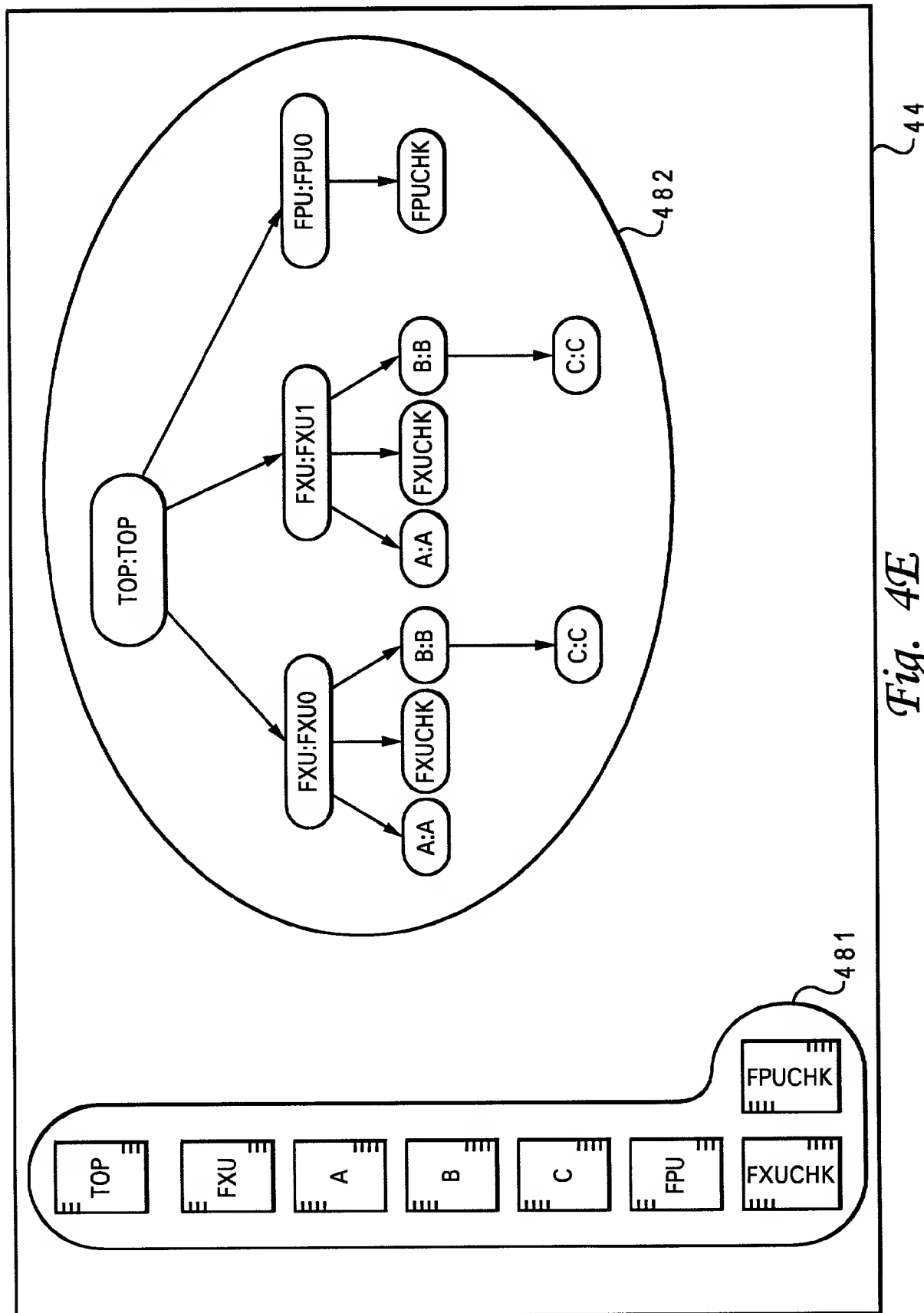


Fig. 4E

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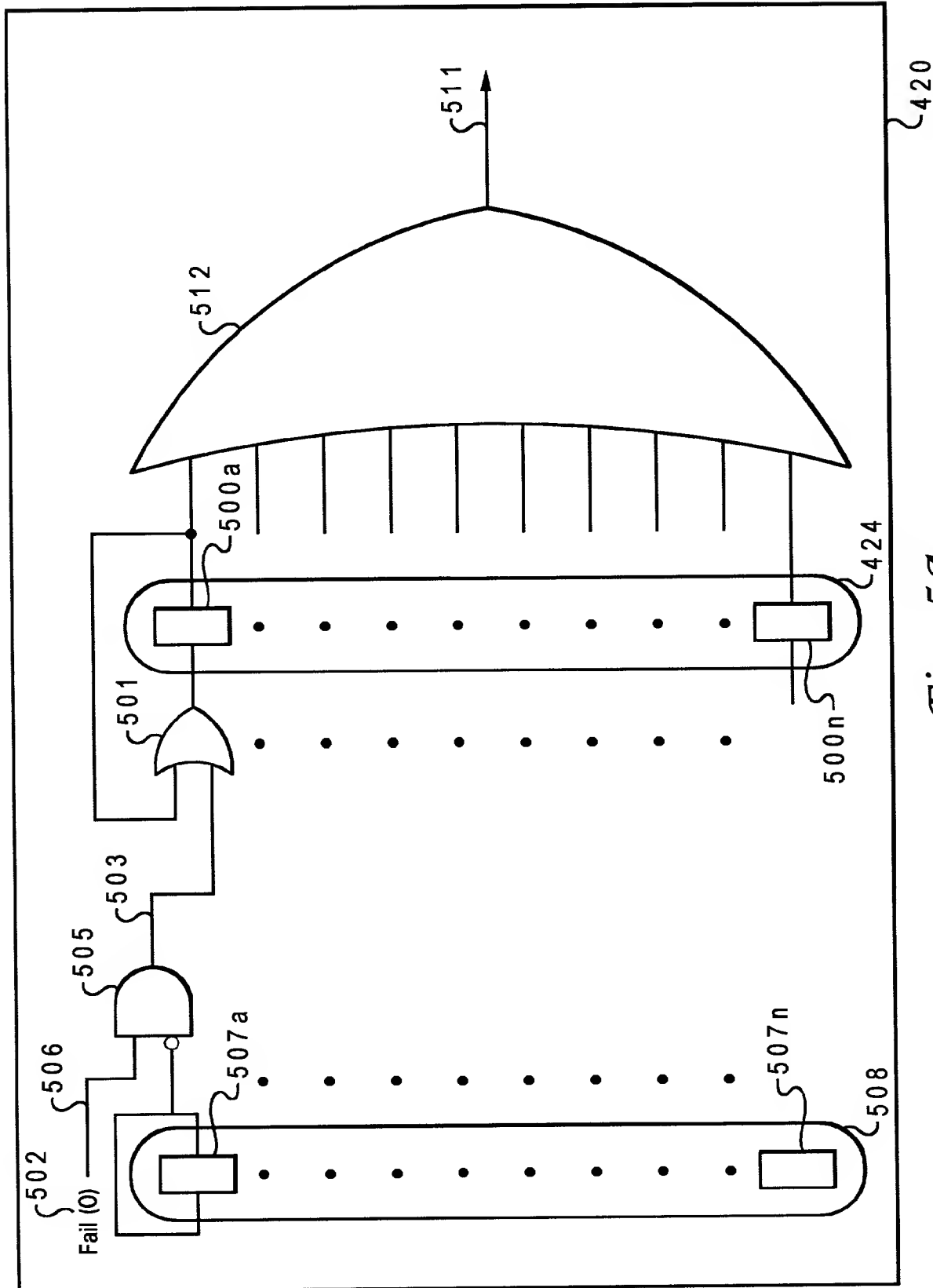


Fig. 5A

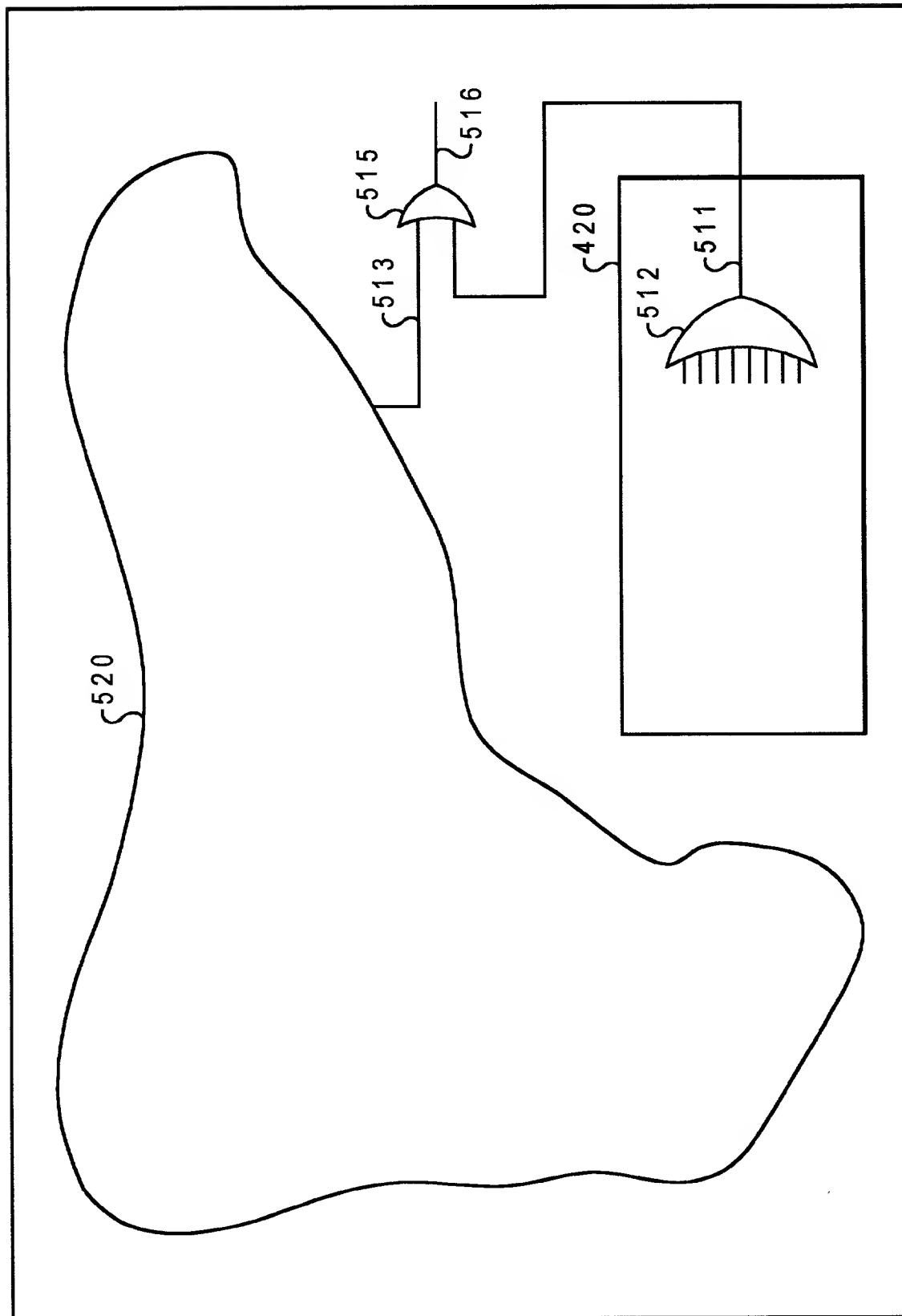


Fig. 5B

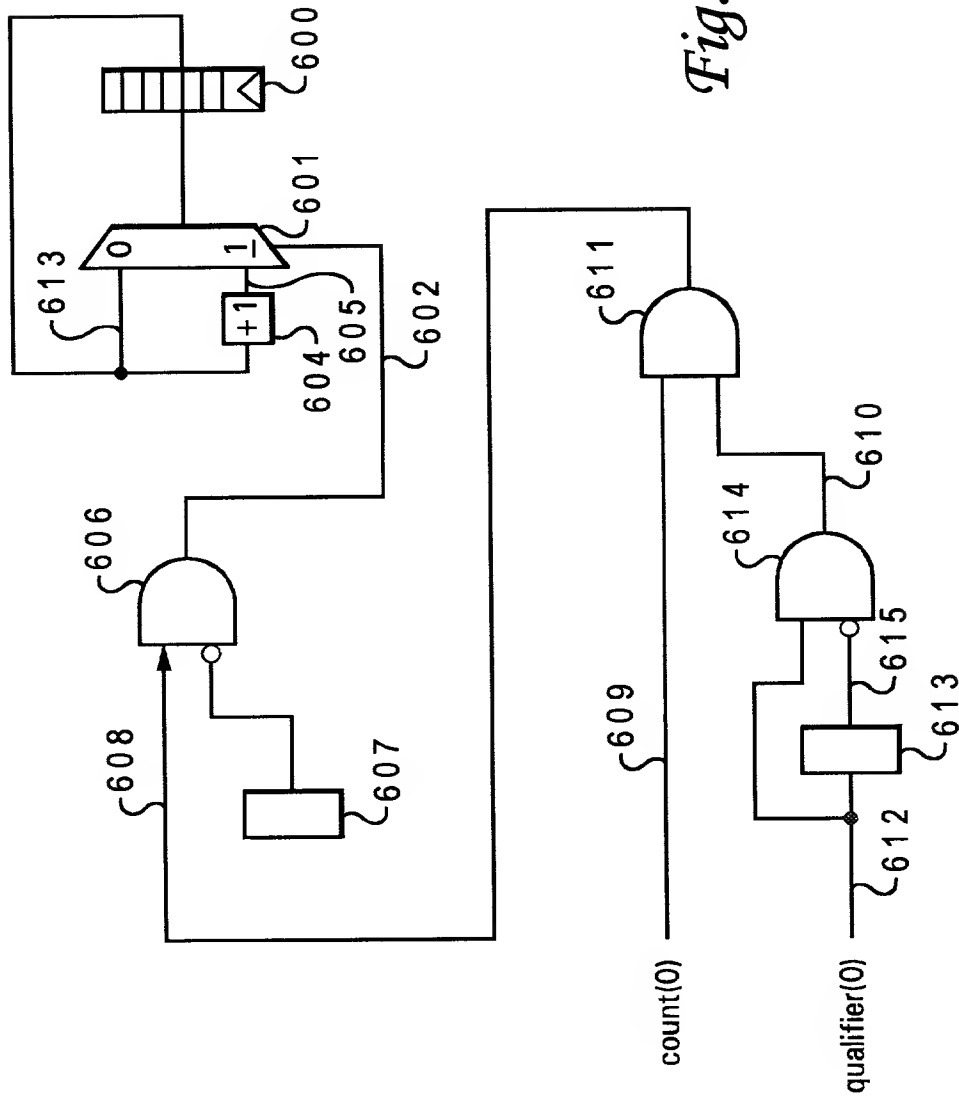


Fig. 6A

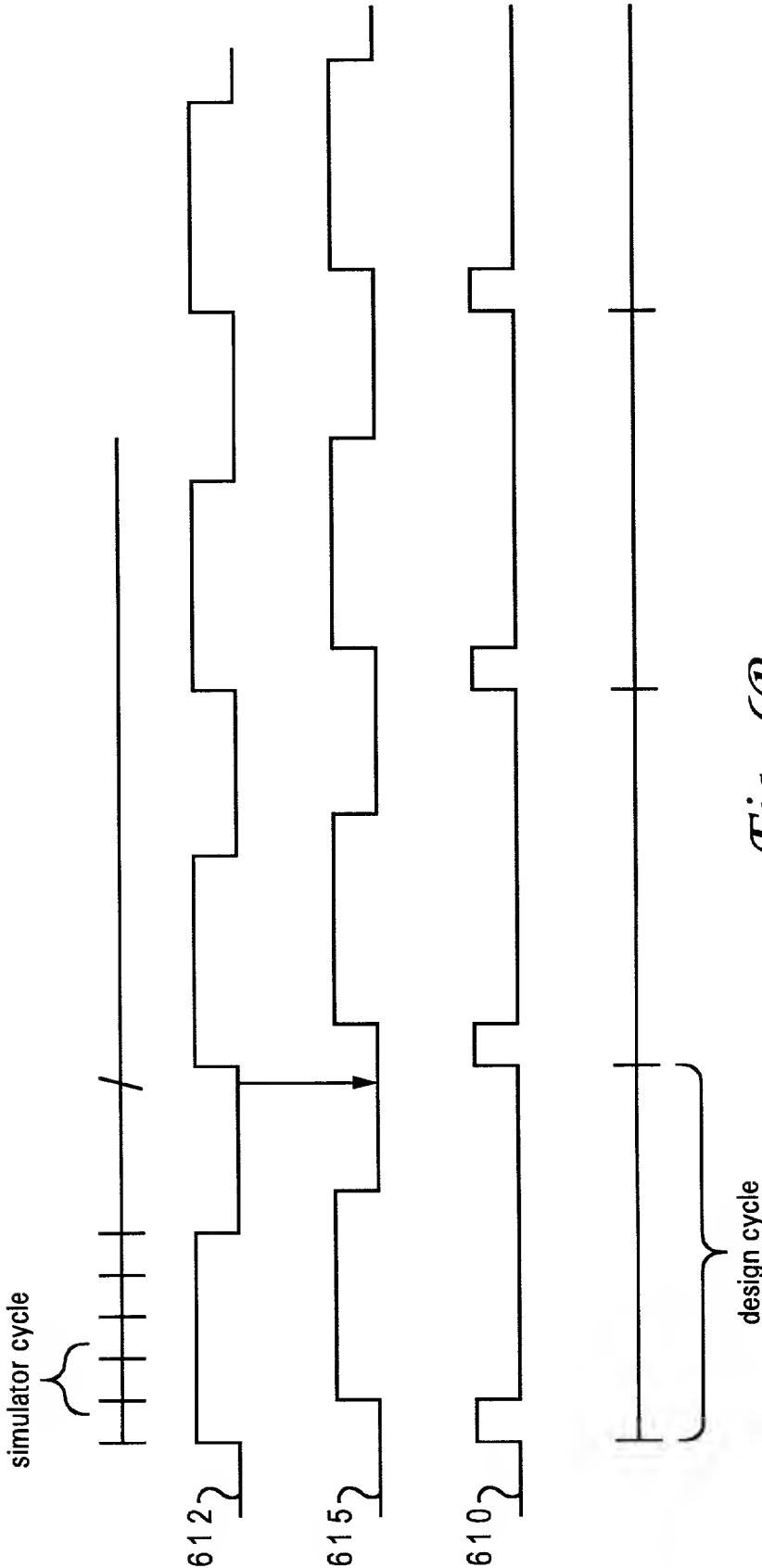


Fig. 6B

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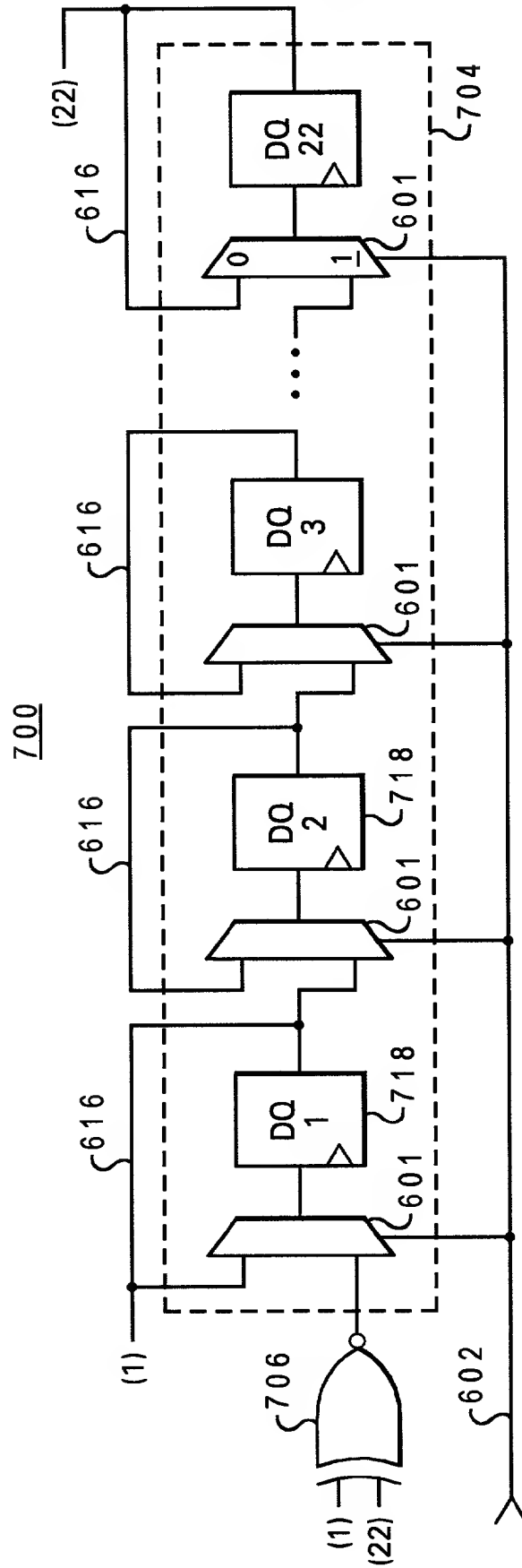


Fig. 7

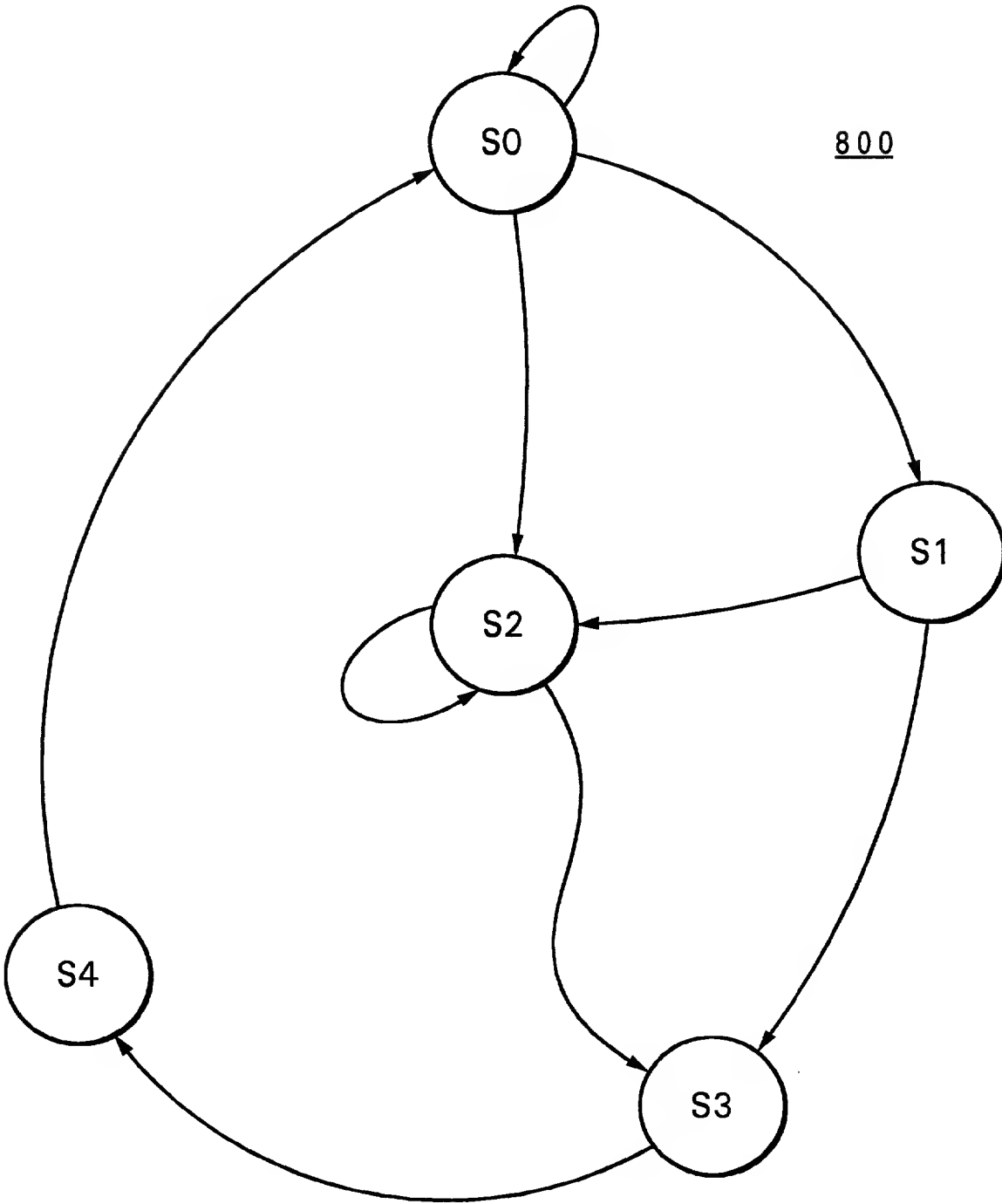


Fig. 8A
Prior Art

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entity FSM : FSM

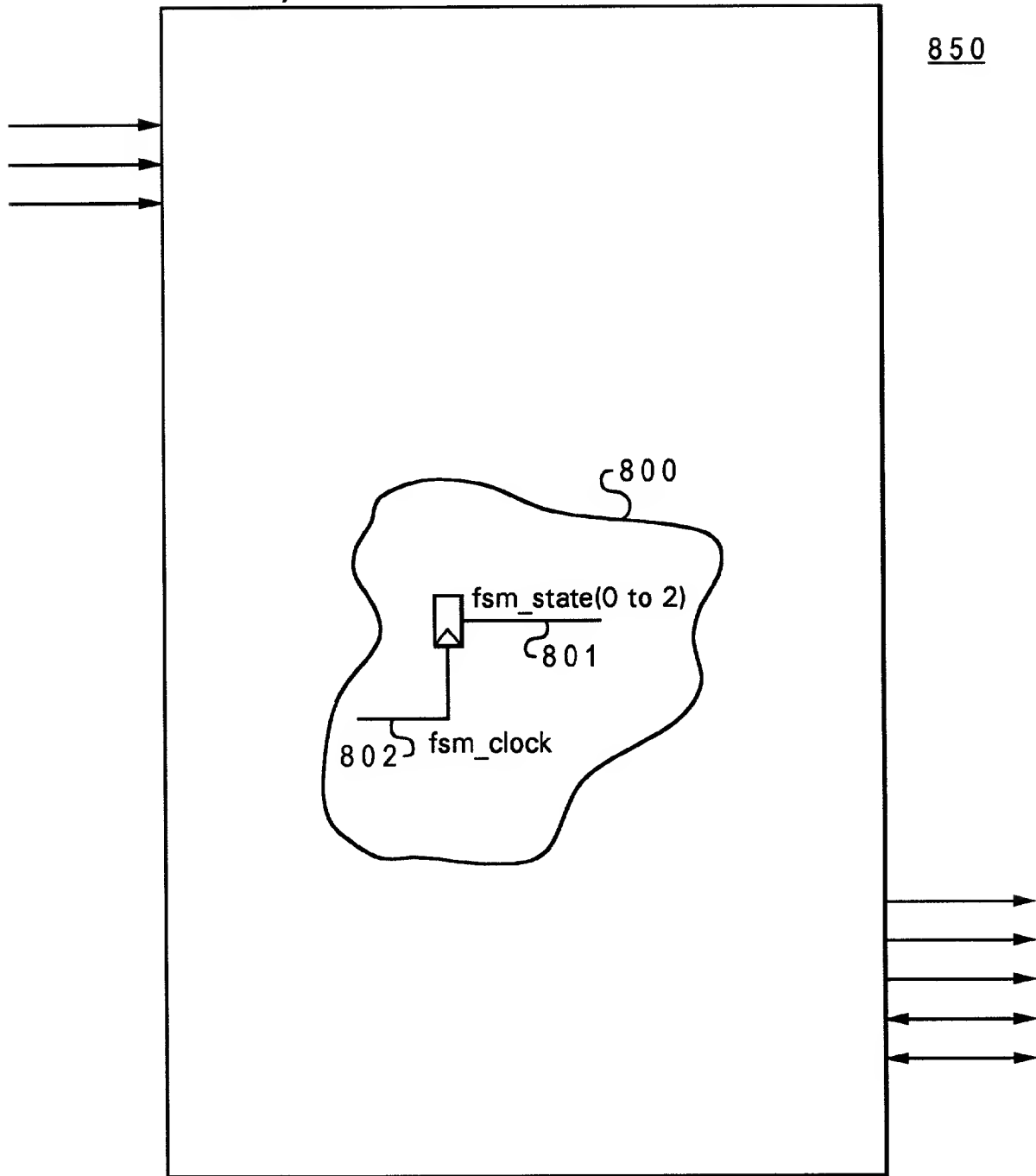


Fig. 8B
Prior Art

END;

Fig. 8C

entity FSM : FSM

850

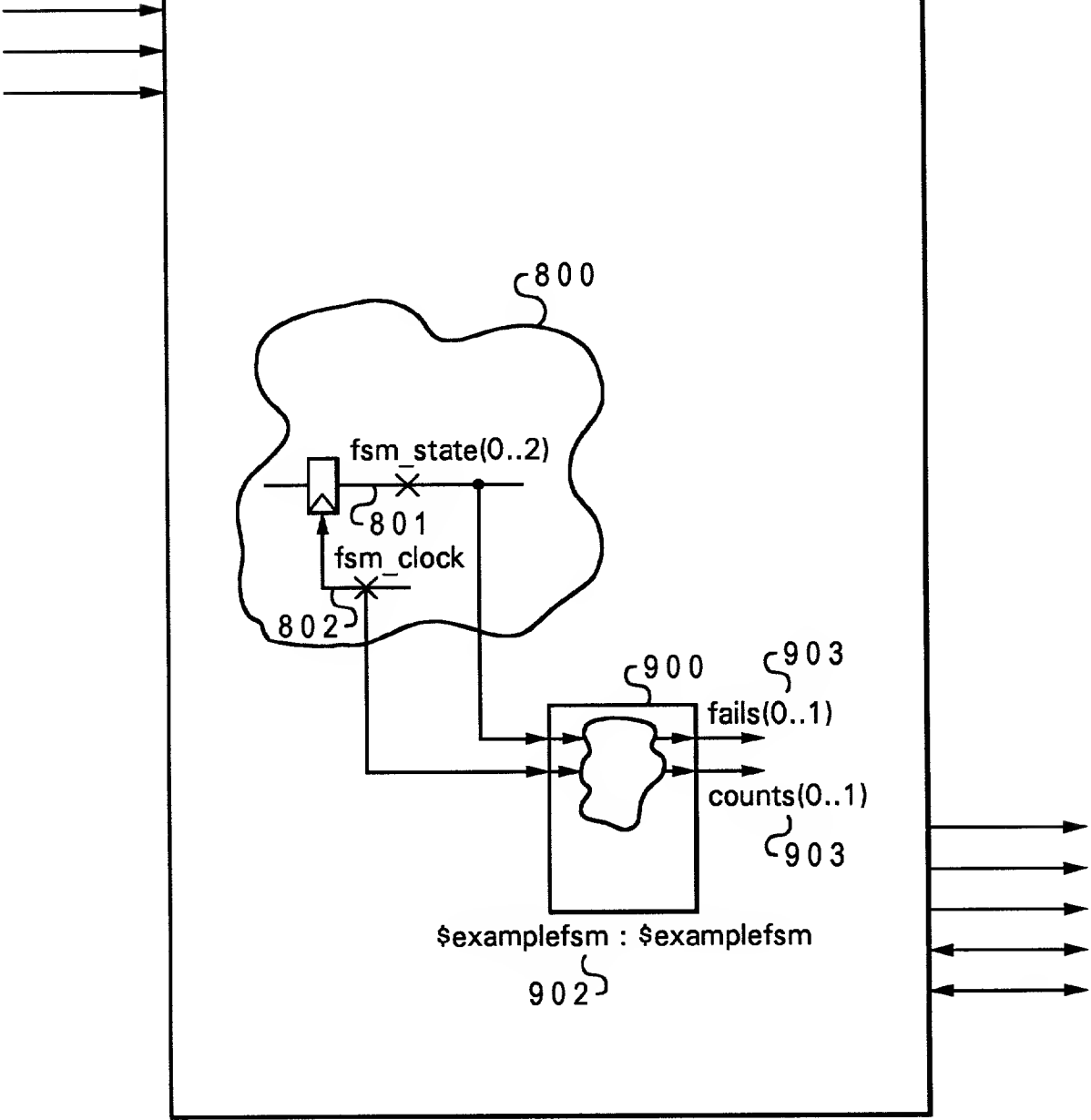


Fig. 9

Fig. 10A

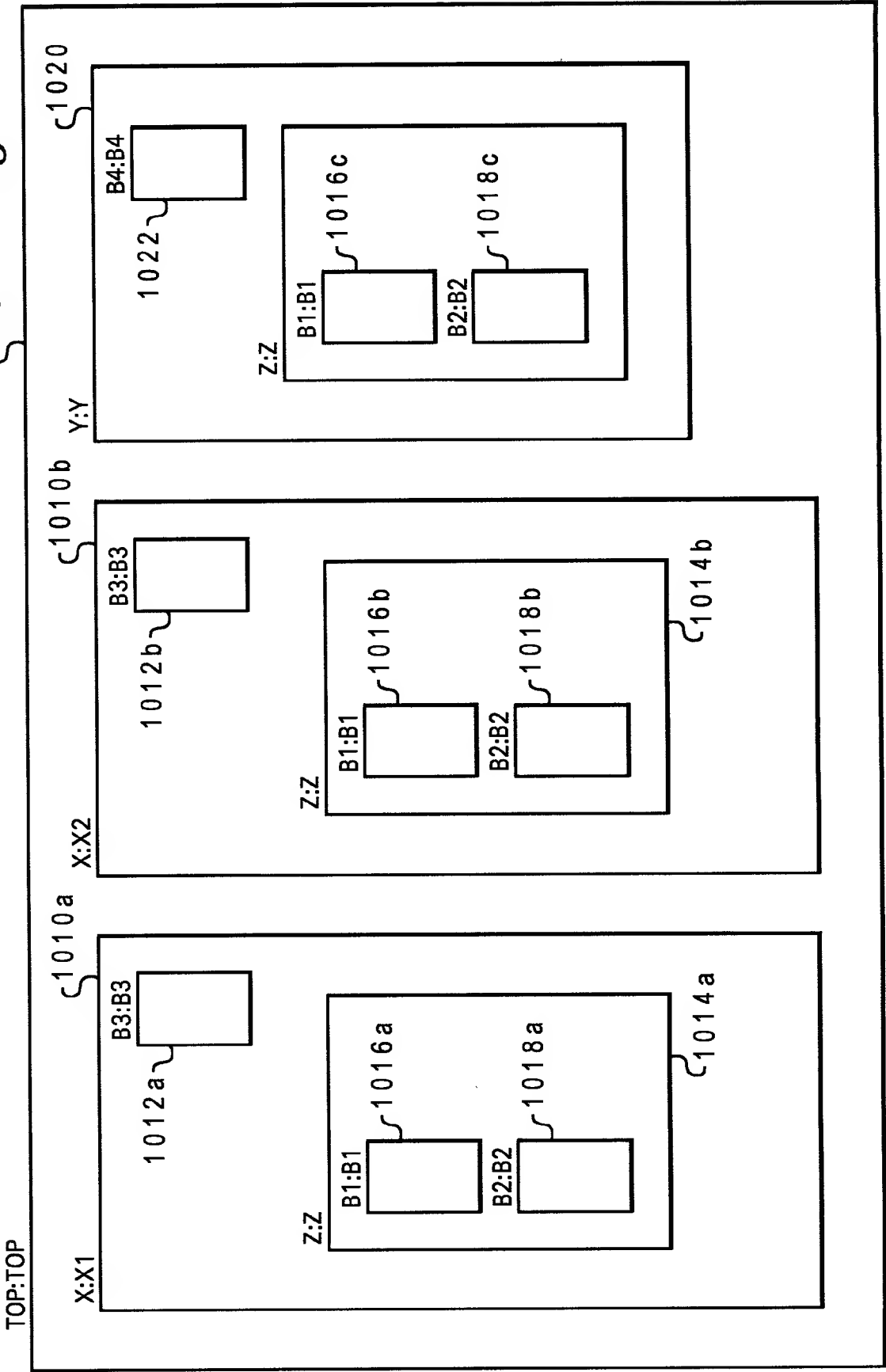
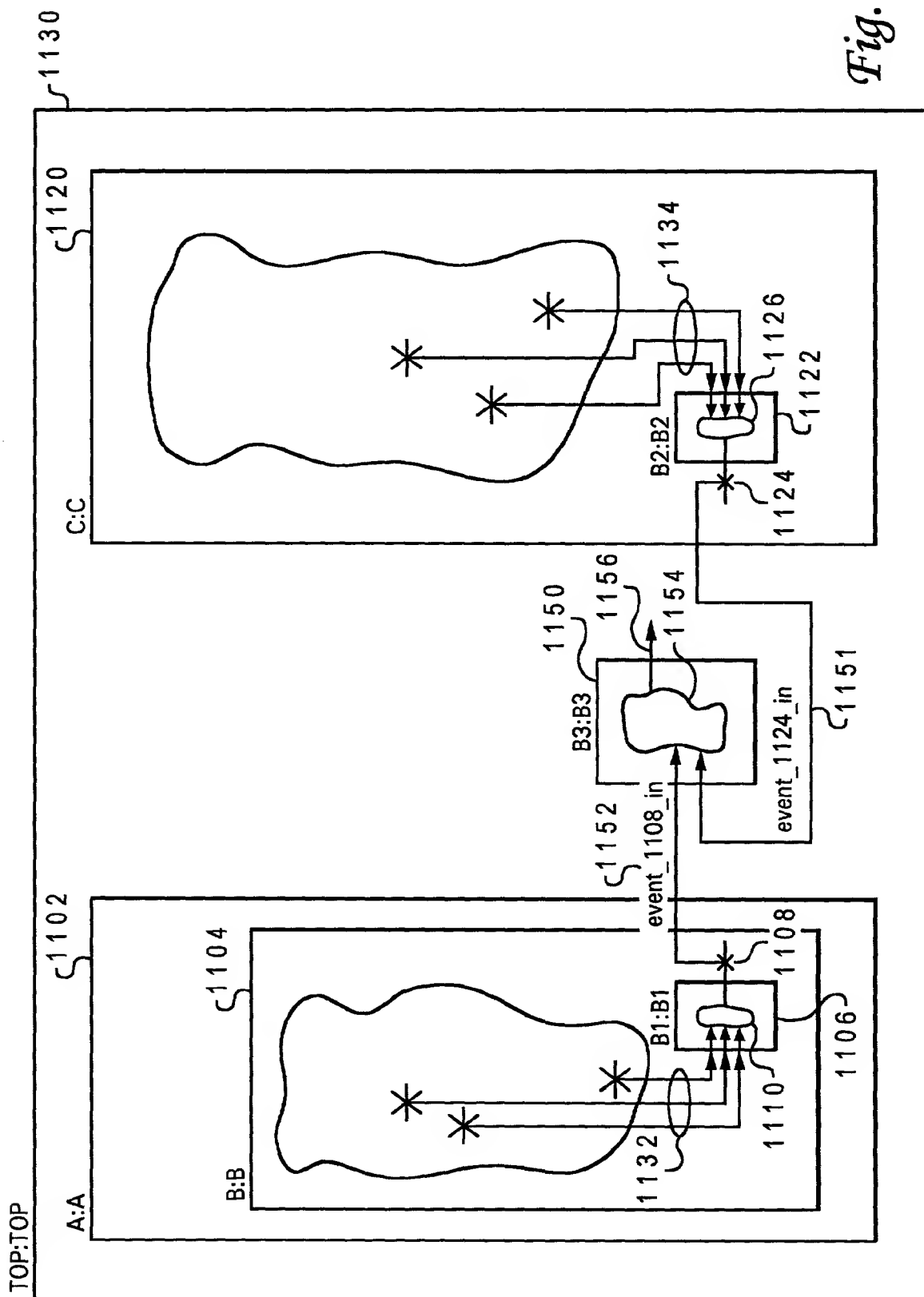


Fig. 10D



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--!! Inputs
--!! event_1108_in <= C.[B2.count.event_1108];
--!! event_1124_in <= A.B.[B1.count.event_1124];
--!! End Inputs

1163 1165 1161 1162 1164 1166

Fig. 11B

--!! Inputs
--!! event_1108_in <= C.[count.event_1108];
--!! event_1124_in <= B.[count.event_1124];
--!! End Inputs

1171 1172

Fig. 11C

202507292650

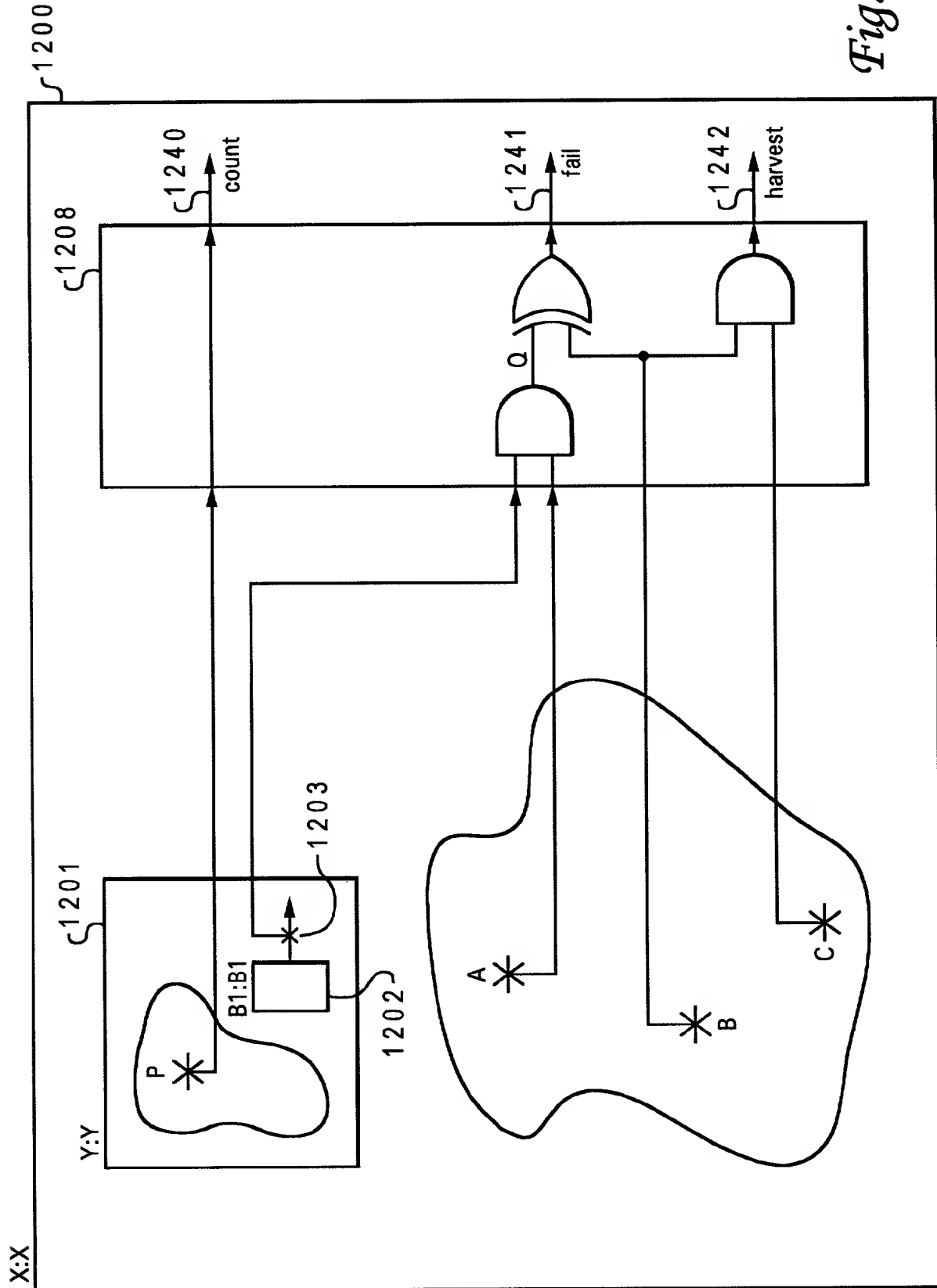


Fig. 12A

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ENTITY X IS

PORT(:
:;
);

ARCHITECTURE example of X IS

BEGIN

.
.
.
.
... HDL code for X ...
.
.
.

1 2 2 1 { Y:Y
PORT MAP(:
);

1 2 2 2 { A <=
B <=
C <=

1 2 2 3 { --!! [count, countname0, clock] <= Y.P; 1 2 3 0
--!! Q <= Y. [B1.count.count1] AND A; 1 2 3 2
--!! [fail, failname0, "fail msg"] <= Q XOR B; 1 2 3 4
--!! [harvest, harvestname0, "harvest msg"] <= B AND C;
END; 1 2 3 6

1 2 2 0

Fig. 12B

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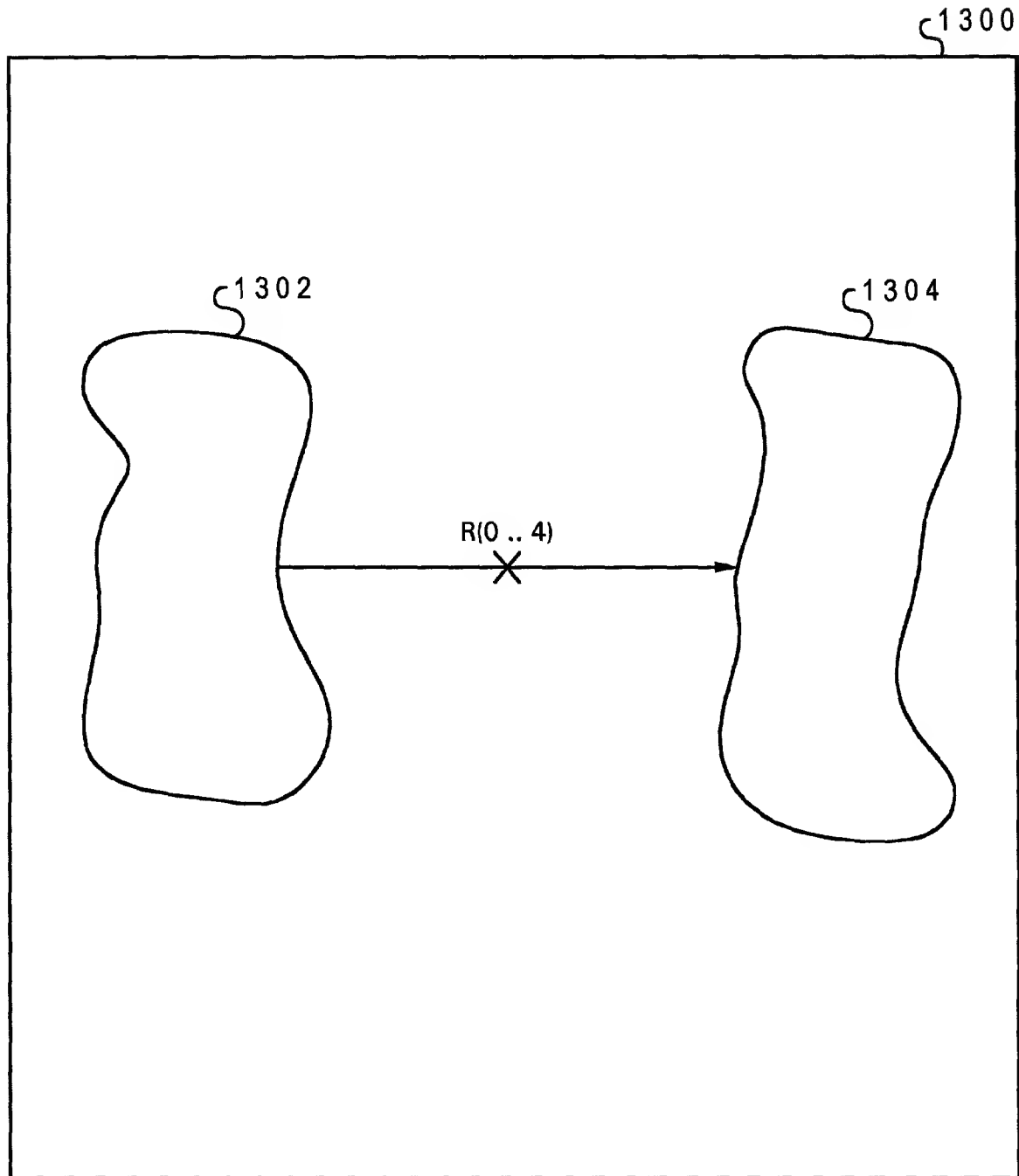
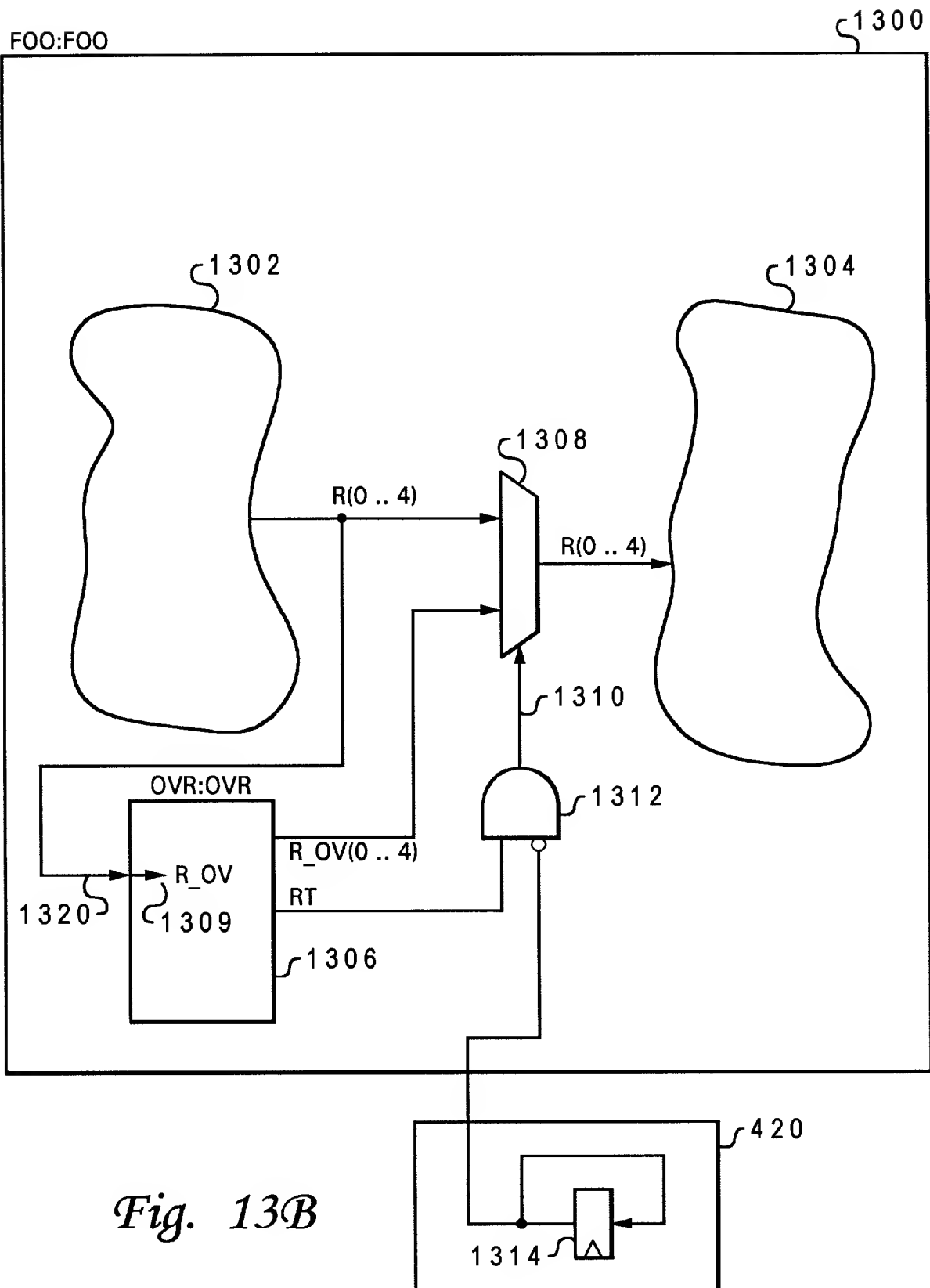


Fig. 13A

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```

ENTITY OVR IS
    PORT(  R_IN      :  IN std_ulogic_vector(0 .. 4);
          .
          .
          ... other ports as required ...
          .
          .
          R_OV      :  OUT std_ulogic_vector(0 .. 4);
          RT        :  OUT std_ulogic
    );

--!! BEGIN
--!! Design Entity: FOO;

--!! Inputs (0 to 4)
--!! R_IN = > {R(0 .. 4)};
--!! :
--!! ... other ports as needed ...
--!! :
--!! End Inputs

--!! Outputs
--!! <R_OVRIDE> : R_OV(0 .. 4) => R(0 .. 4) [RT];
--!! End Outputs

--!! End

ARCHITECTURE example of OVR IS

BEGIN
    ... HDL code for entity body section ...

END;

```

1364

1362

1363

1360

1361

1356

1351

1340

1358

Fig. 13C

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ENTITY FOO IS

PORT(:
:;
:;
);

ARCHITECTURE example of FOO IS

BEGIN

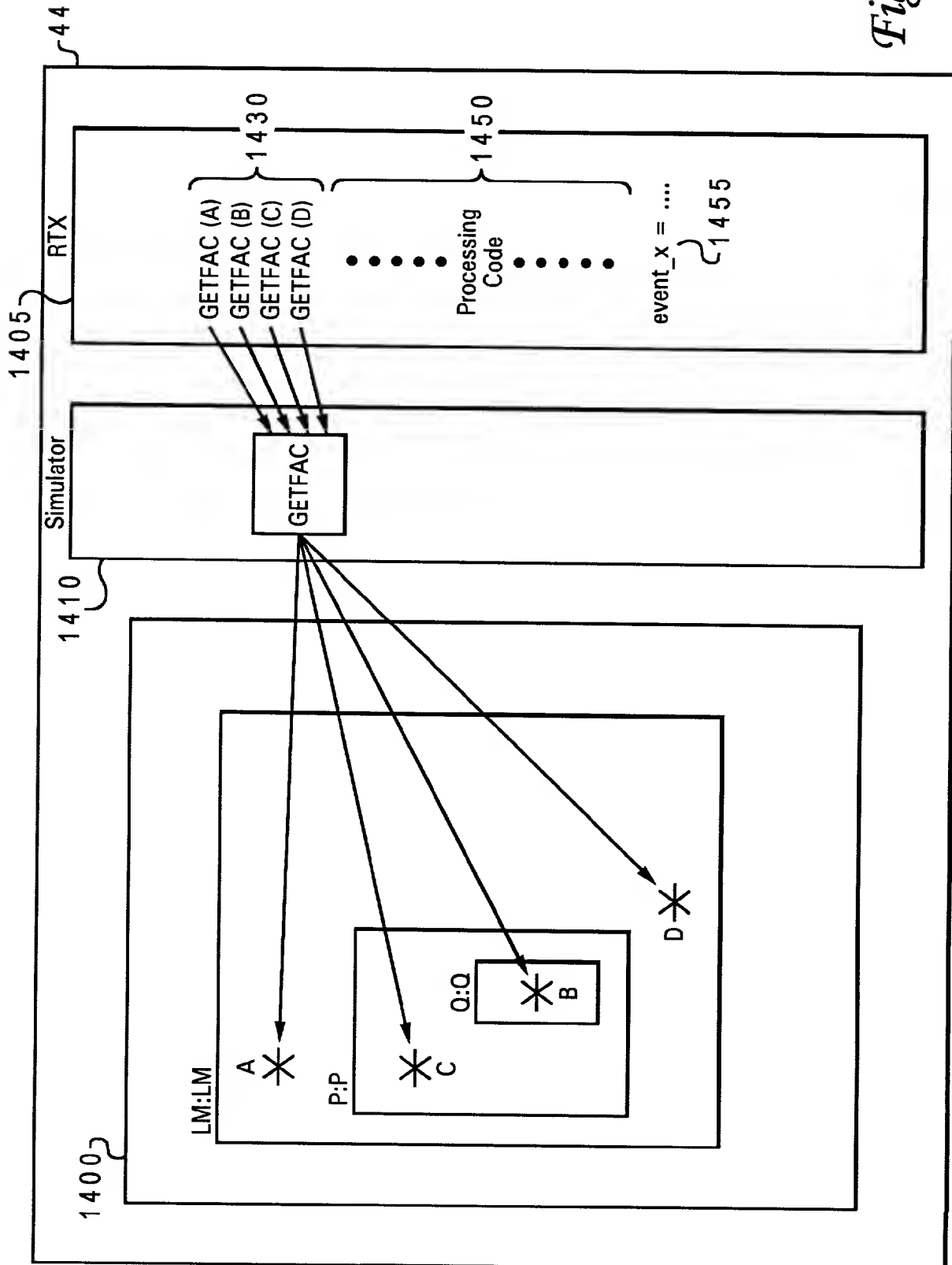
.
.
.
.
.
R <=
.
.
.
.

1380 { --!! R_IN <= {R}; 1381
--!! 1382
--!!
--!! R_OV(0 to 4) <=; 1383
--!! RT <=;
--!! [override, R_OVRRIDE, R(0 .. 4), RT] <= R_OV(0 to 4);
1384

Fig. 13D

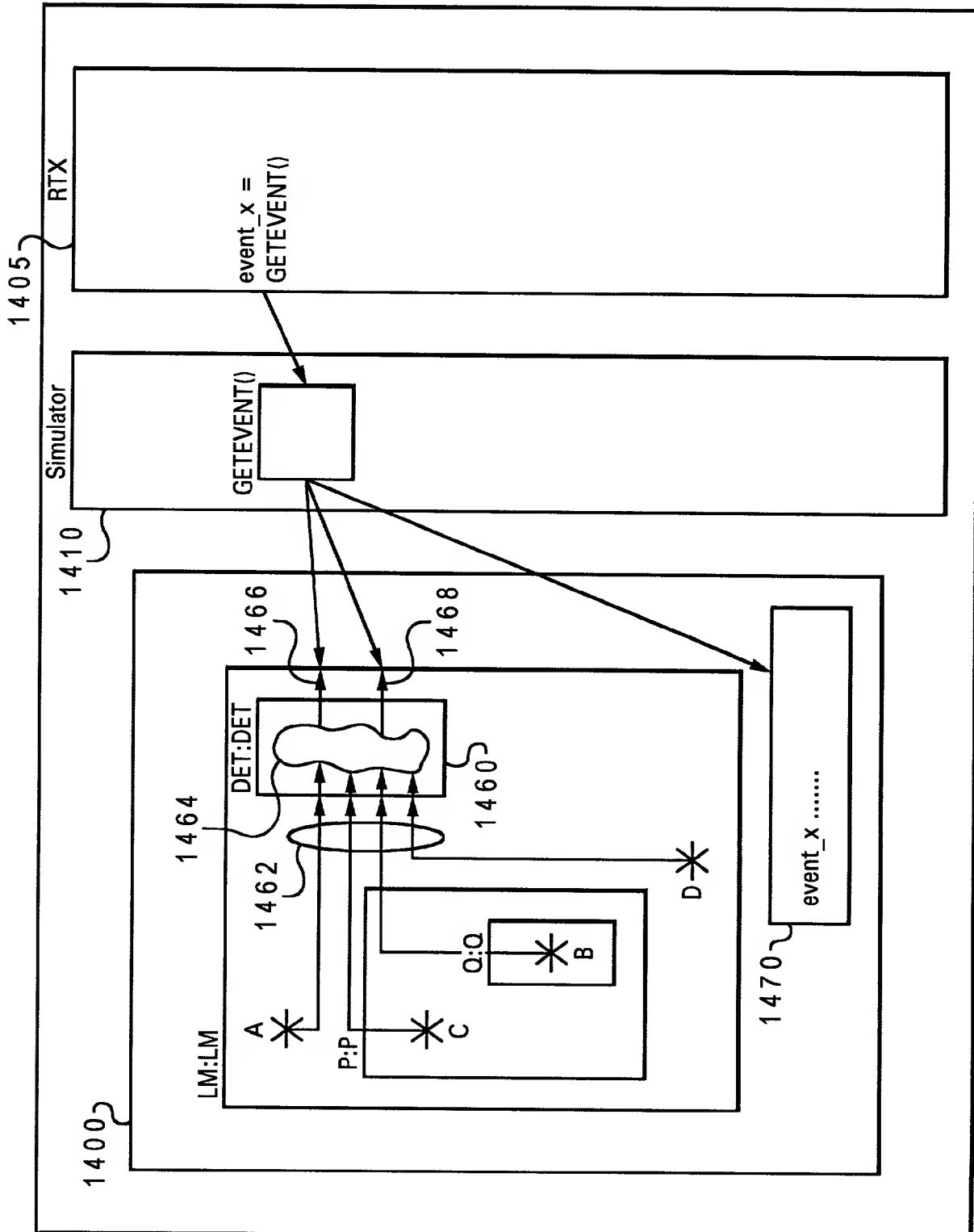
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Fig. 14A



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Fig. 14B



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```

ENTITY DET IS
    PORT(
        A      : IN std_ulogic;
        B      : IN std_ulogic_vector(0 to 5);
        C      : IN std_ulogic;
        D      : IN std_ulogic;
        :      :
        :      :
        event_x : OUT std_ulogic_vector(0 to 2);
        x_here  : OUT std_ulogic;
    );
--!! BEGIN
--!! Design Entity: LM;

--!! Inputs
--!! A  =>  A;
--!! B  =>  P.Q.B;
--!! C  =>  P.C;
--!! D  =>  D;
--!! End Inputs

--!! Detections
--!! <event_x>:event_x(0 to 2) [x_here];
--!! End Detections

--!! End;

ARCHITECTURE example of DET IS
BEGIN
    ... HDL code ...

END;
    
```

1491 {

1493 {

1495 {

1494 {

1480 {

Fig. 14C

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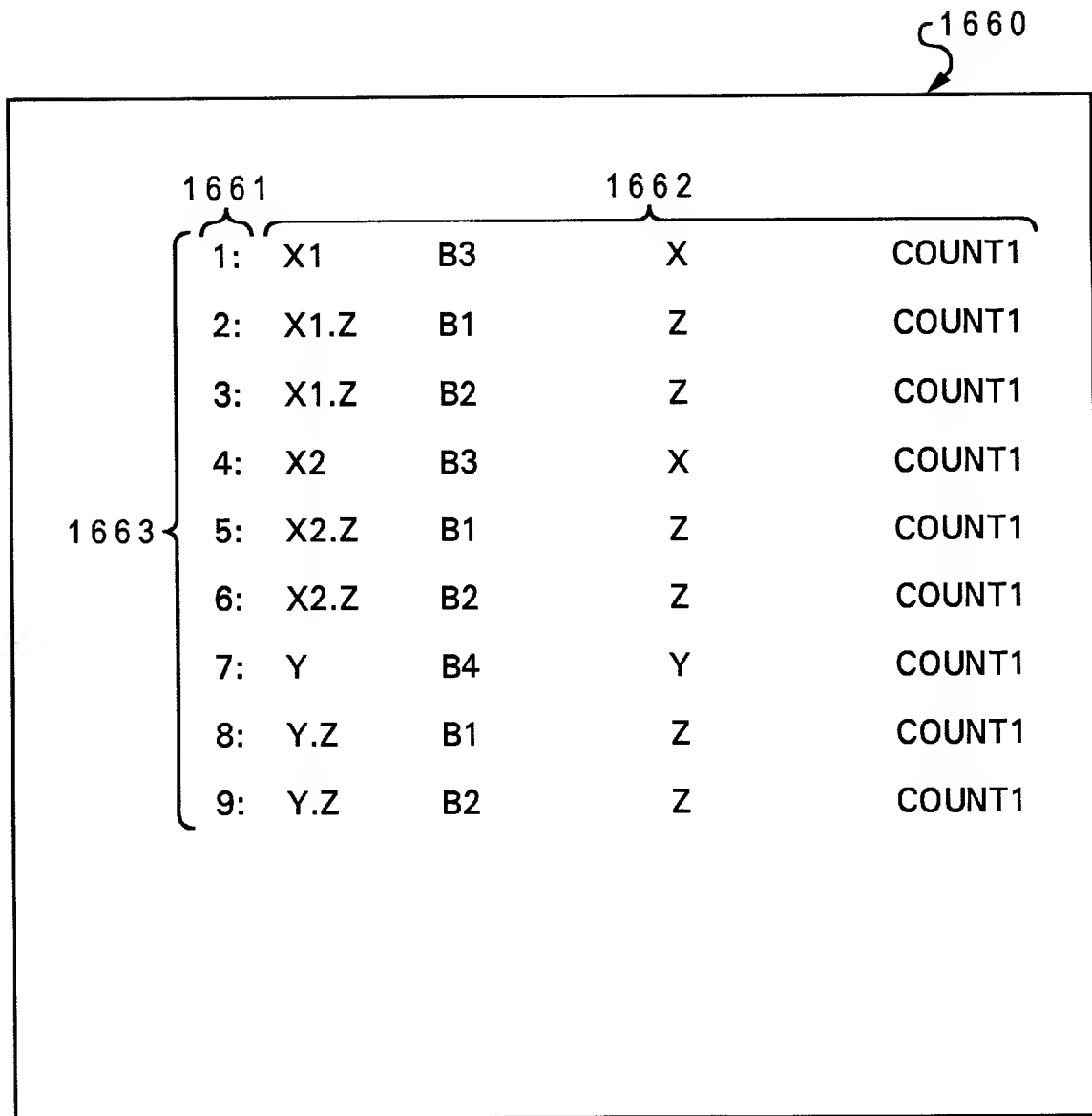
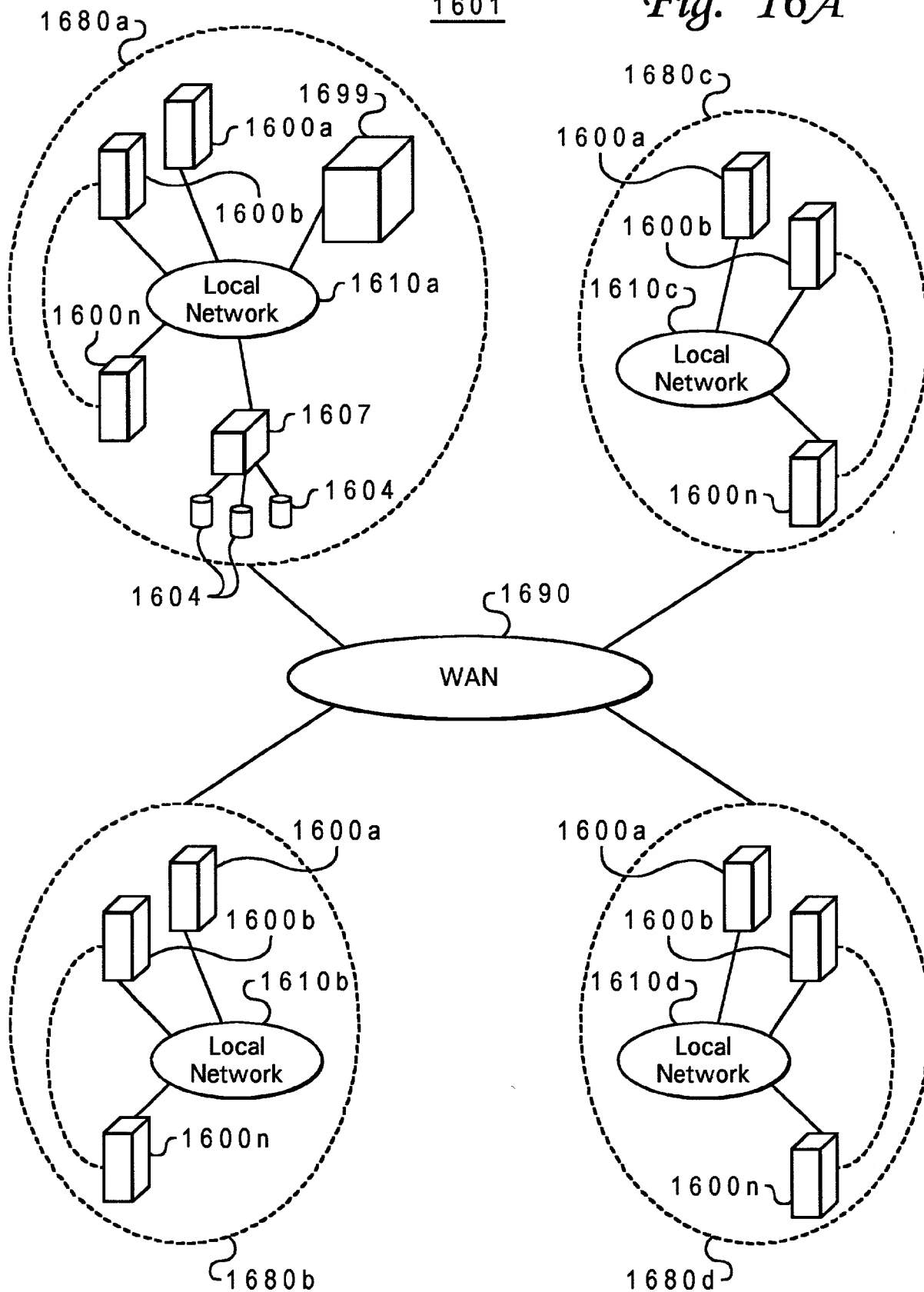


Fig. 15

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Fig. 16A



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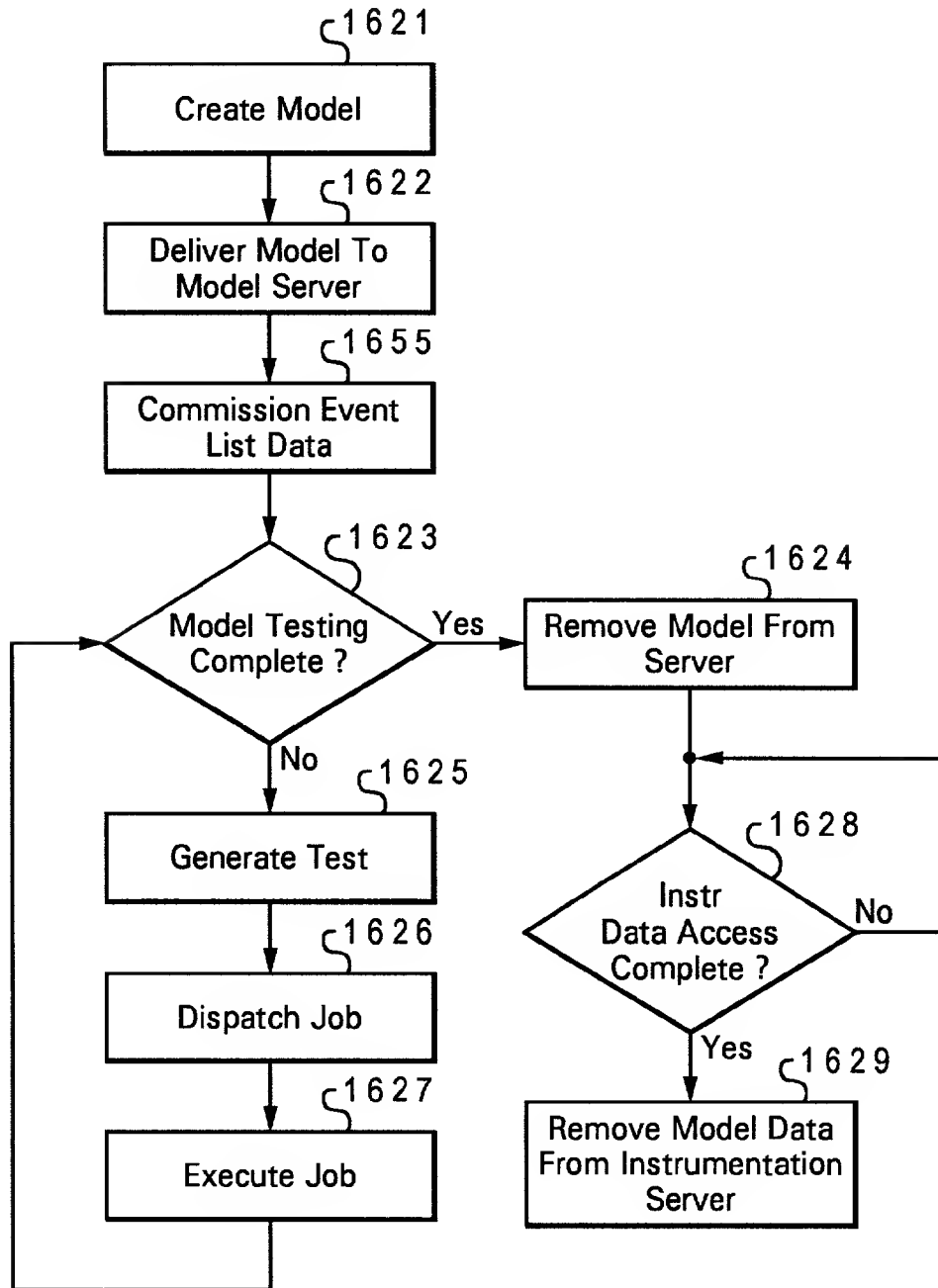


Fig. 16B

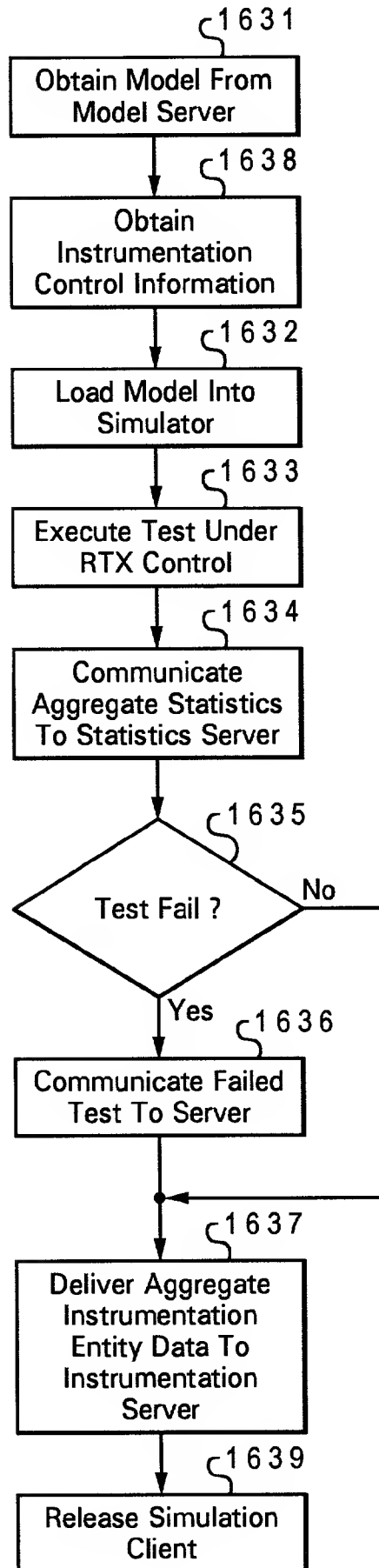


Fig. 16C

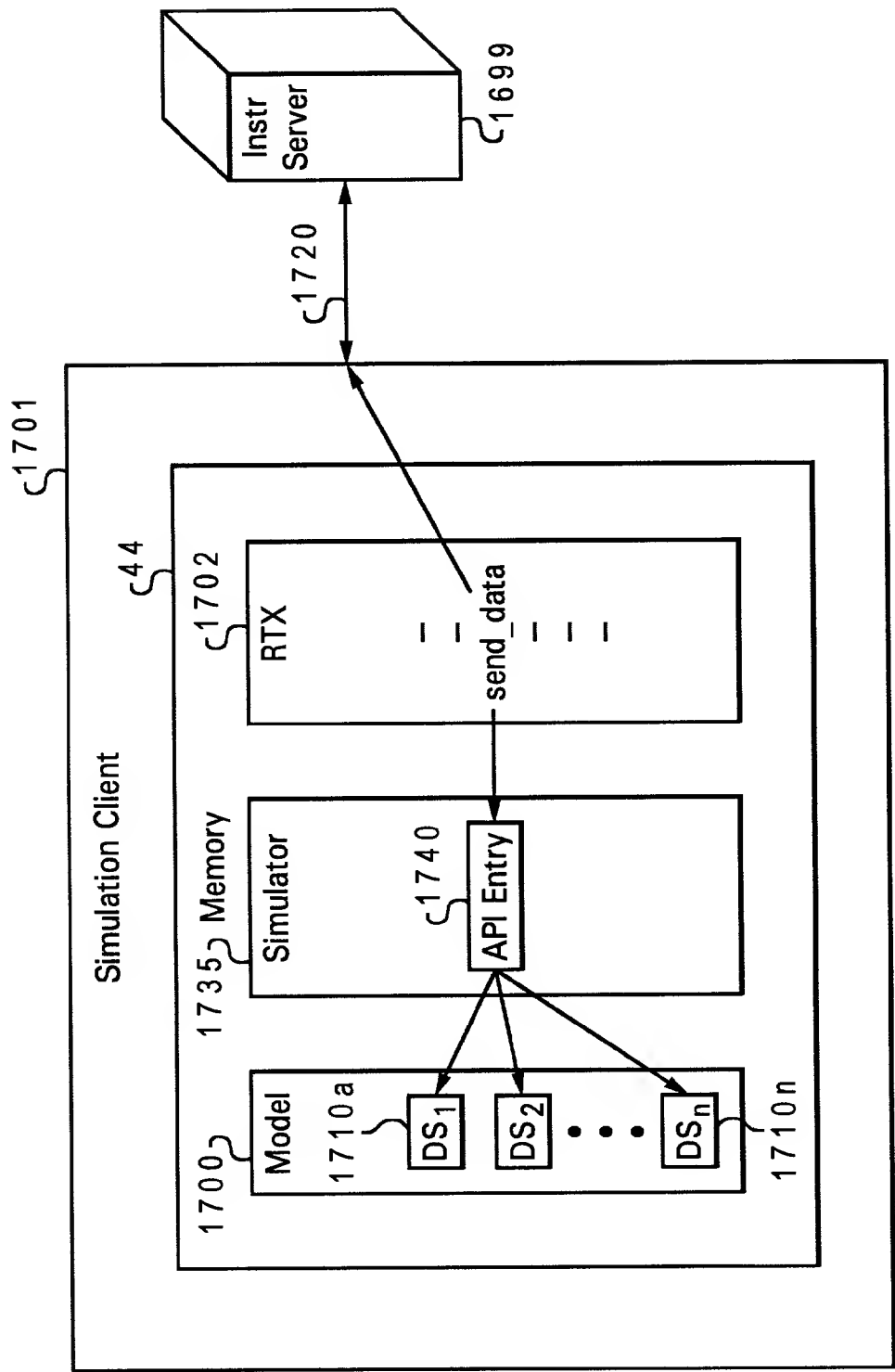


Fig. 17A

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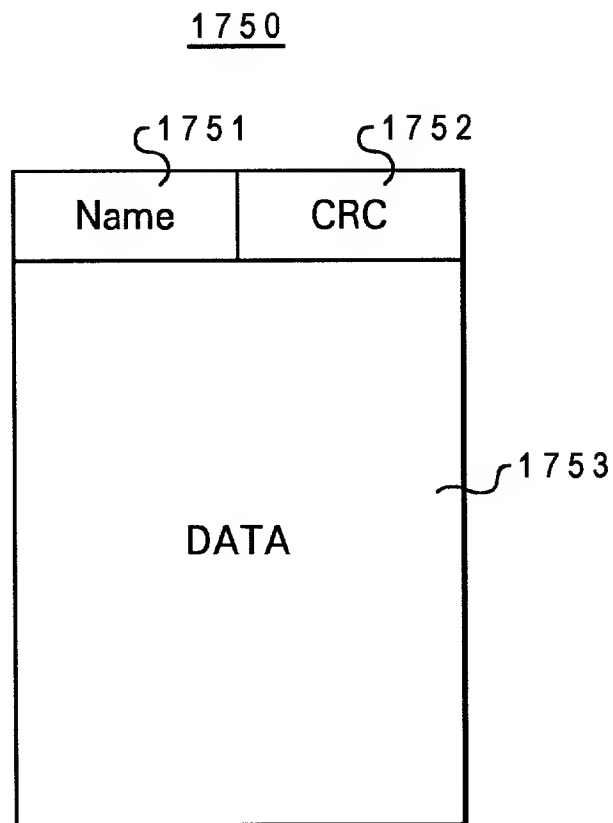


Fig. 17B

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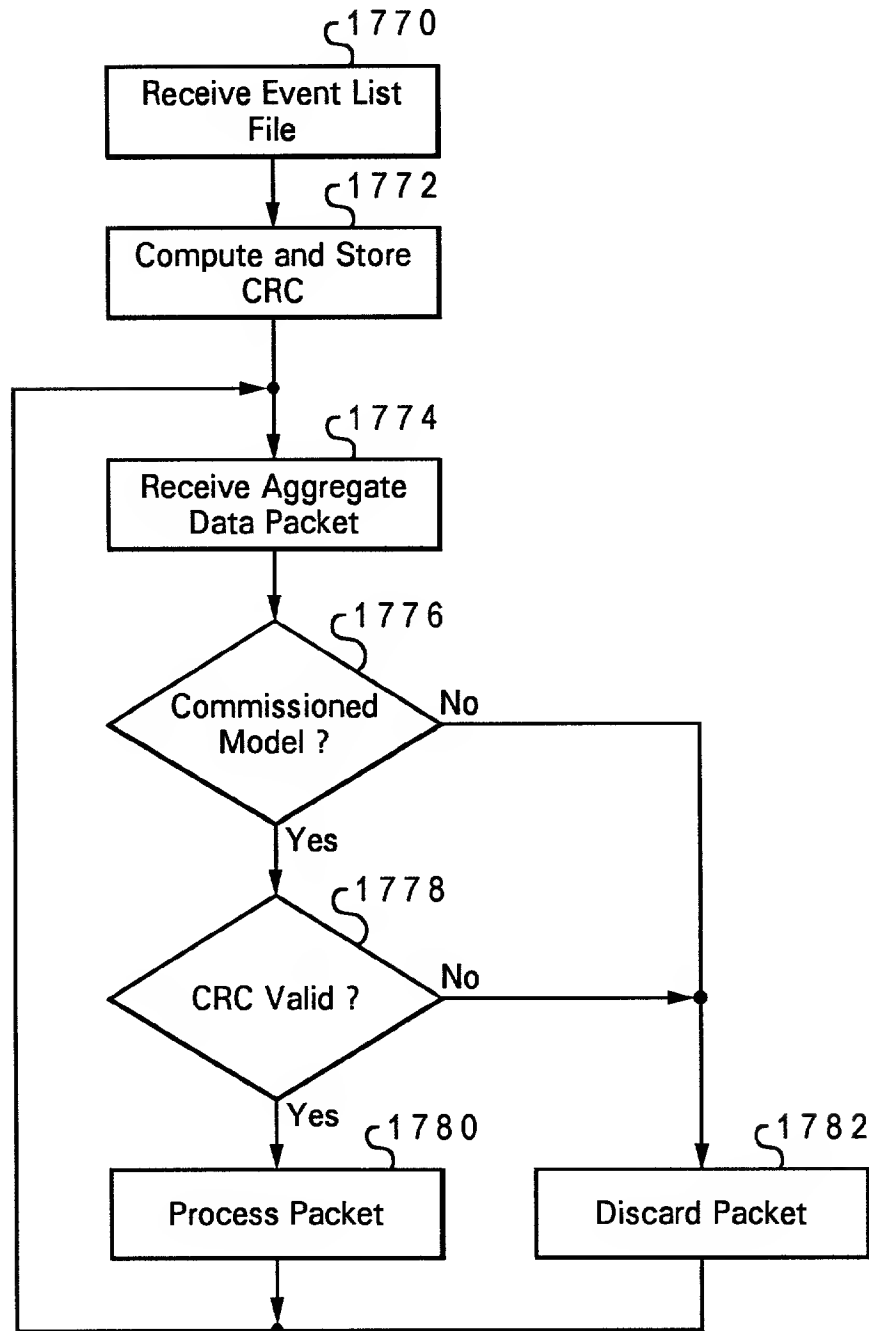
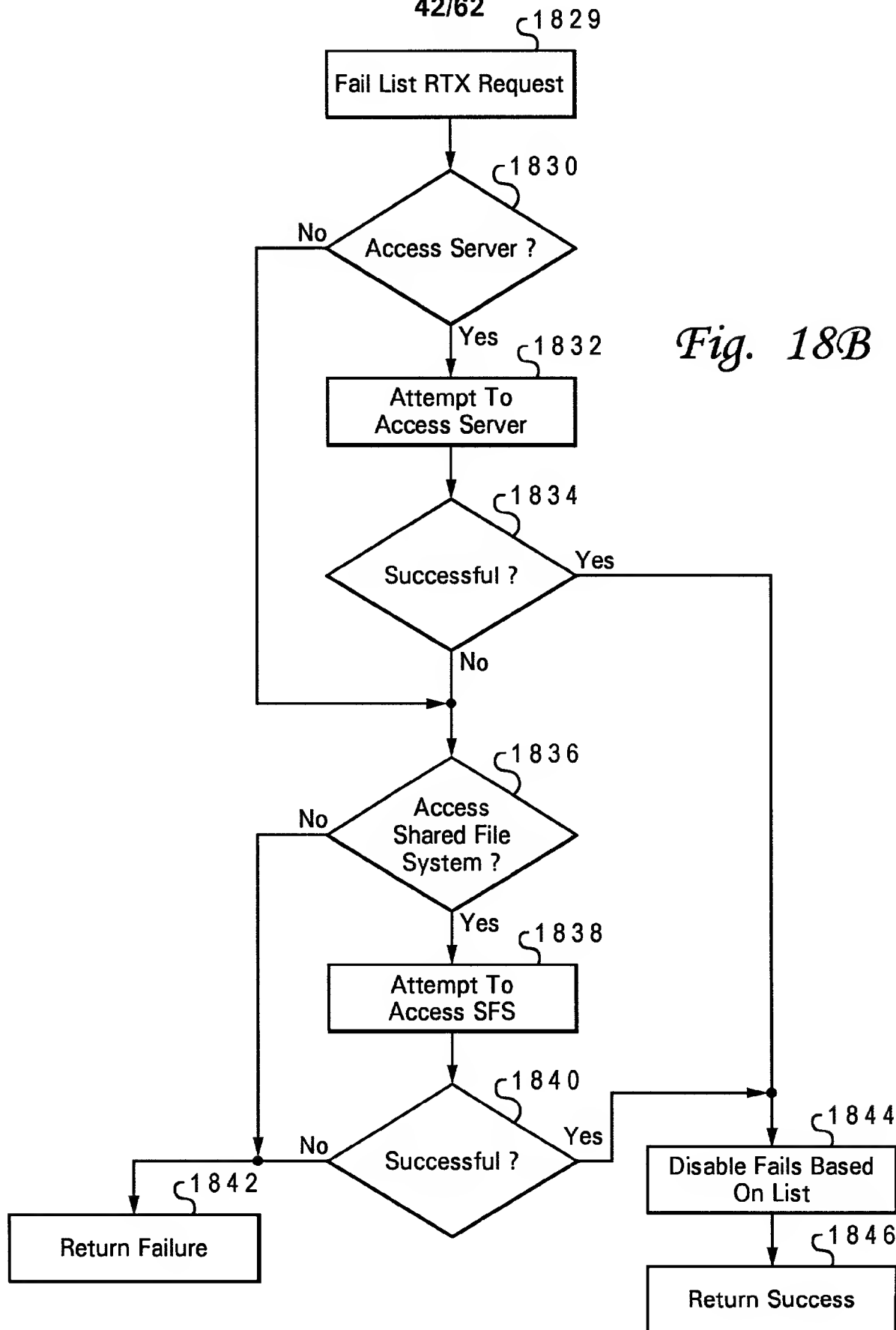


Fig. 17C

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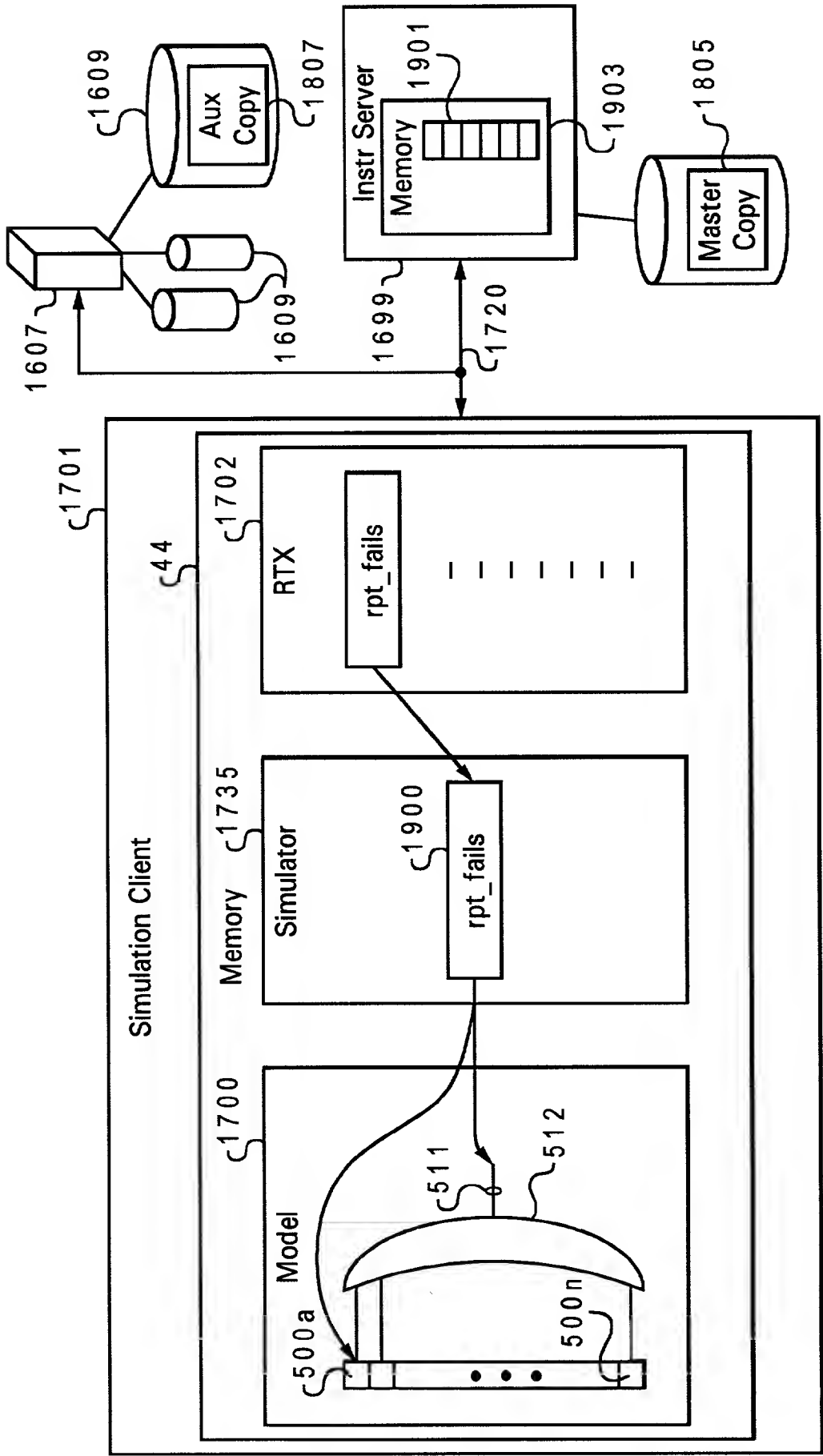
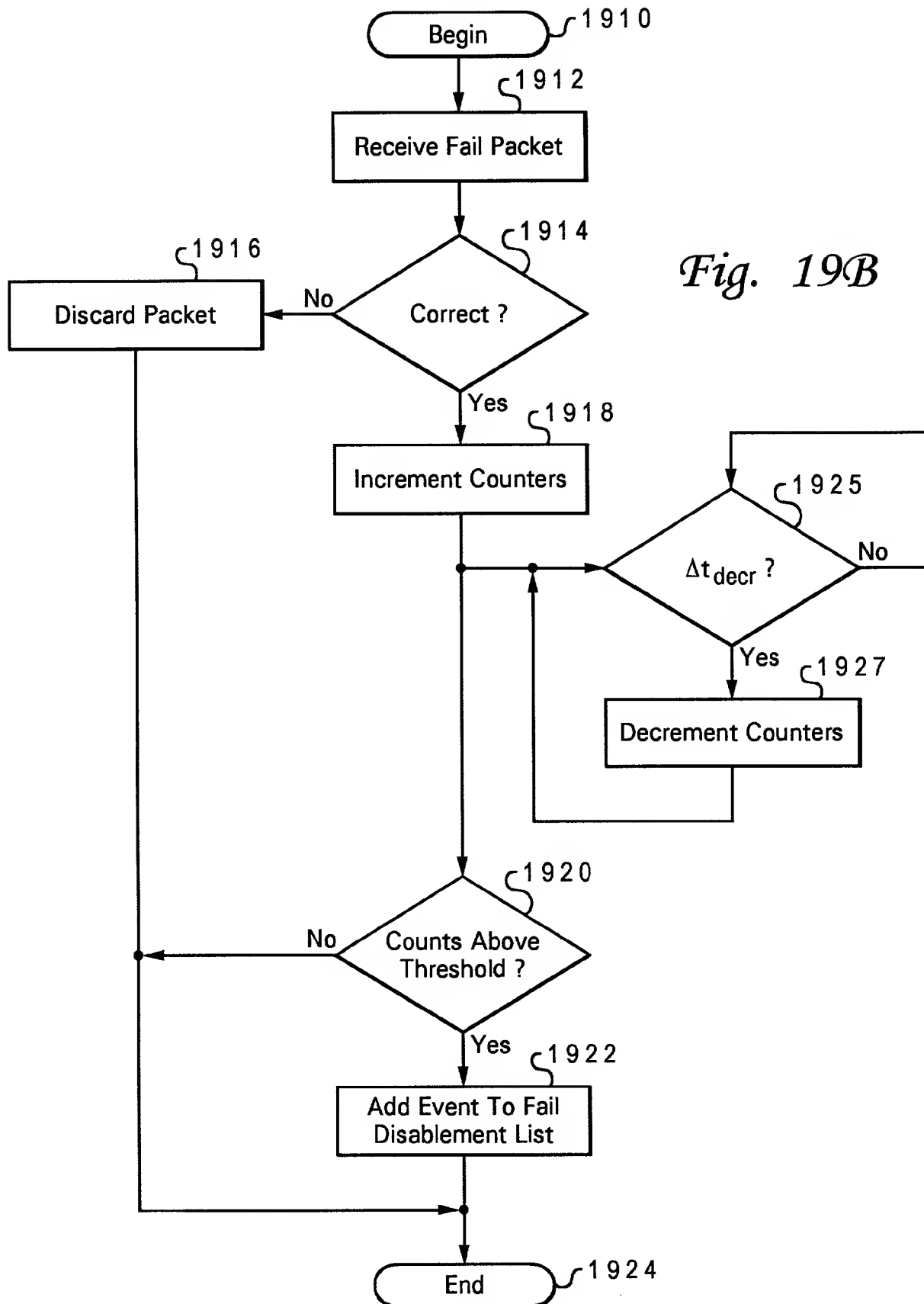


Fig. 19A

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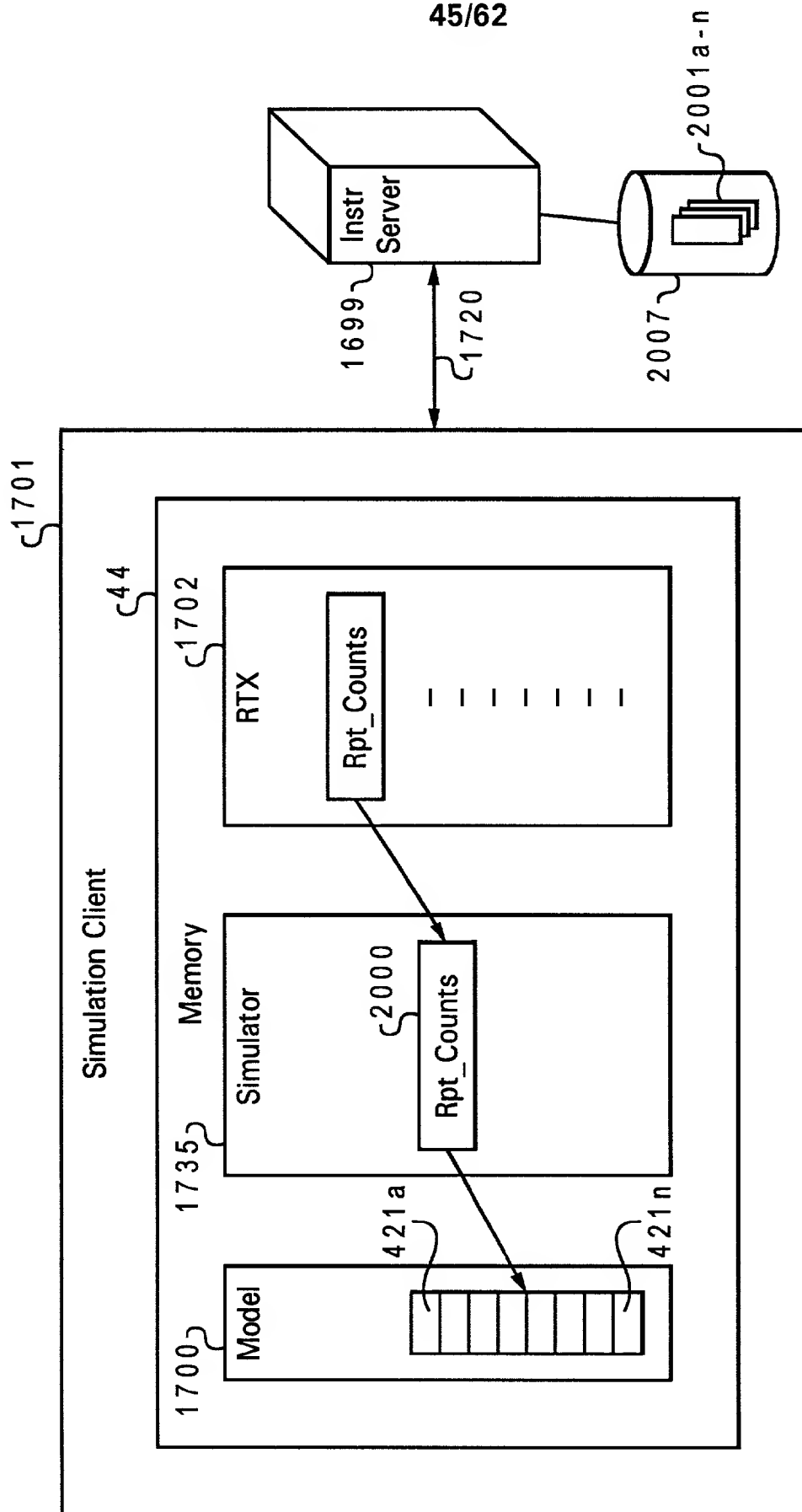


Fig. 20A

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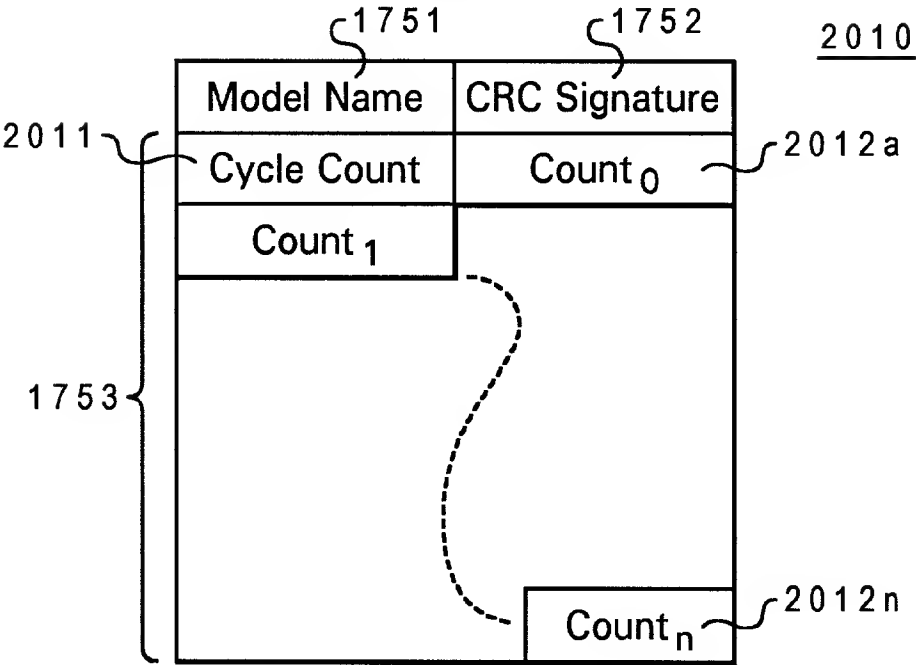


Fig. 20B

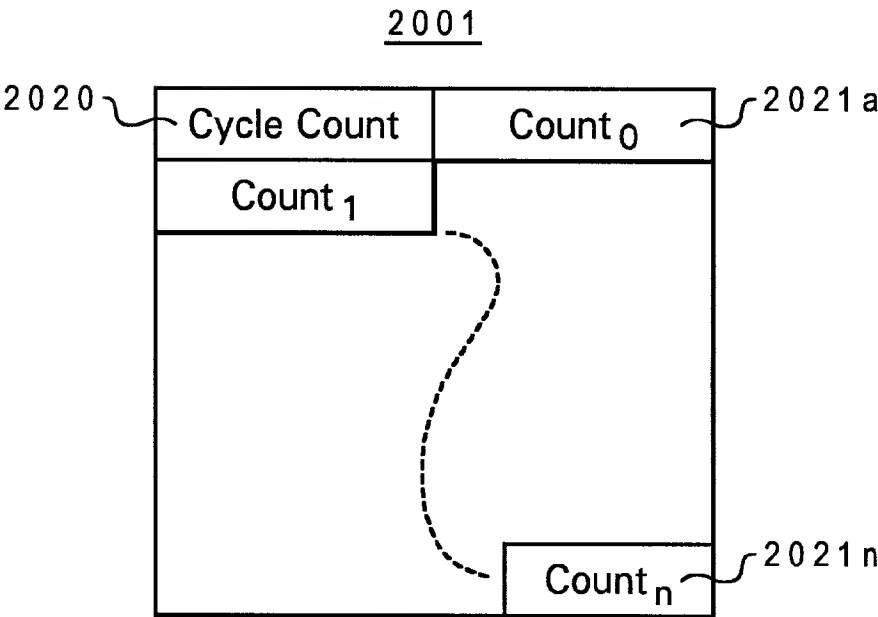


Fig. 20C

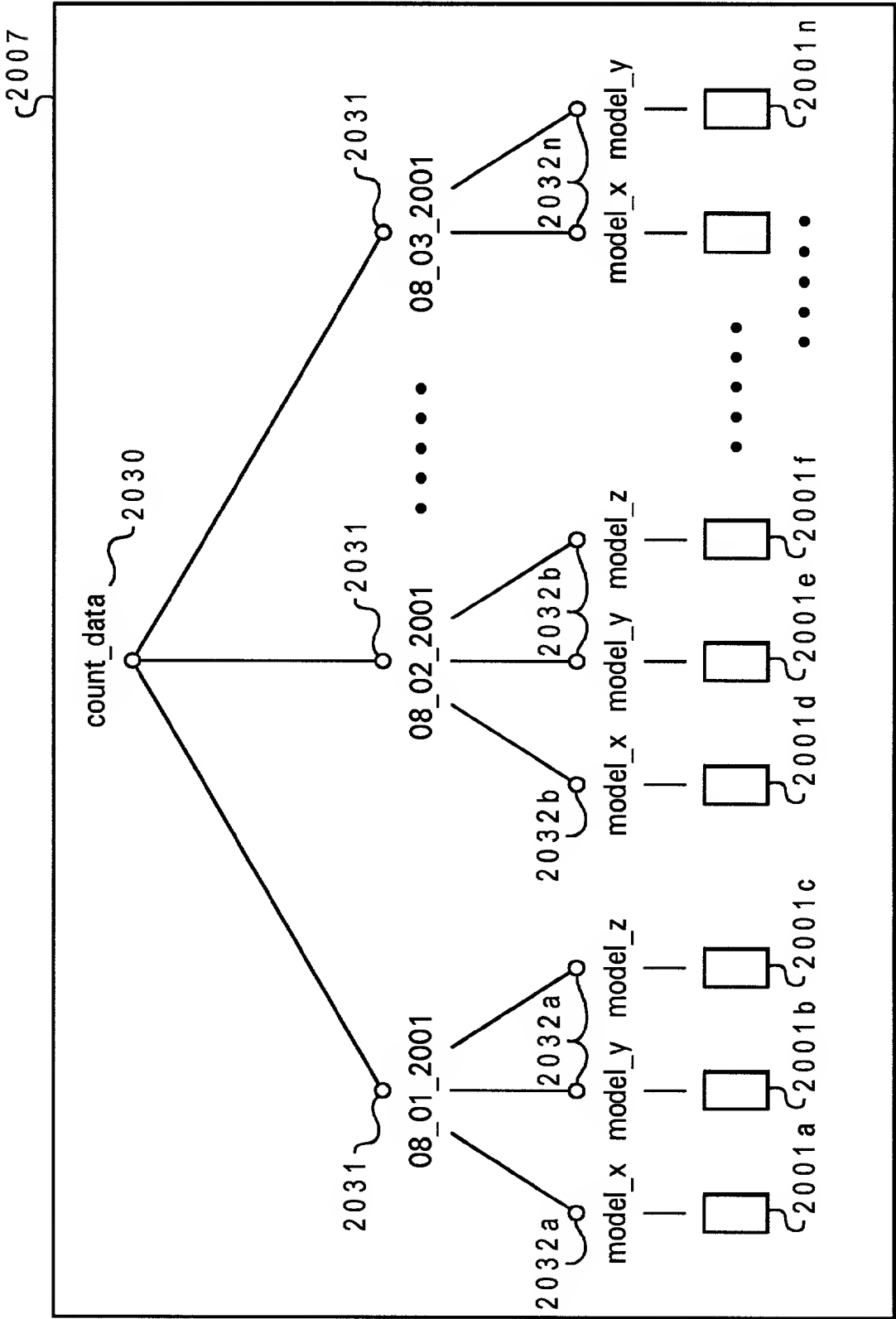


Fig. 20D

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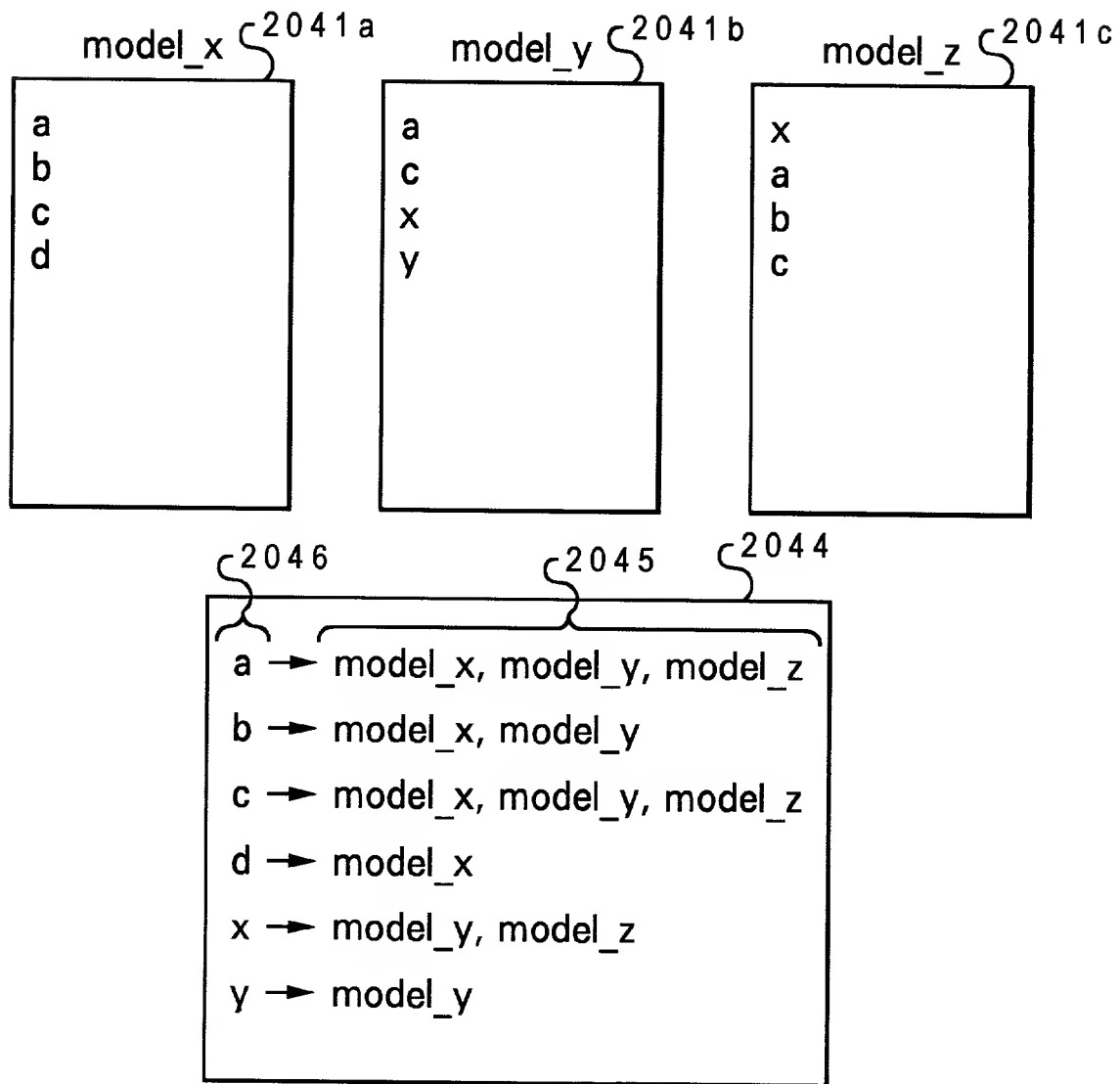


Fig. 20E

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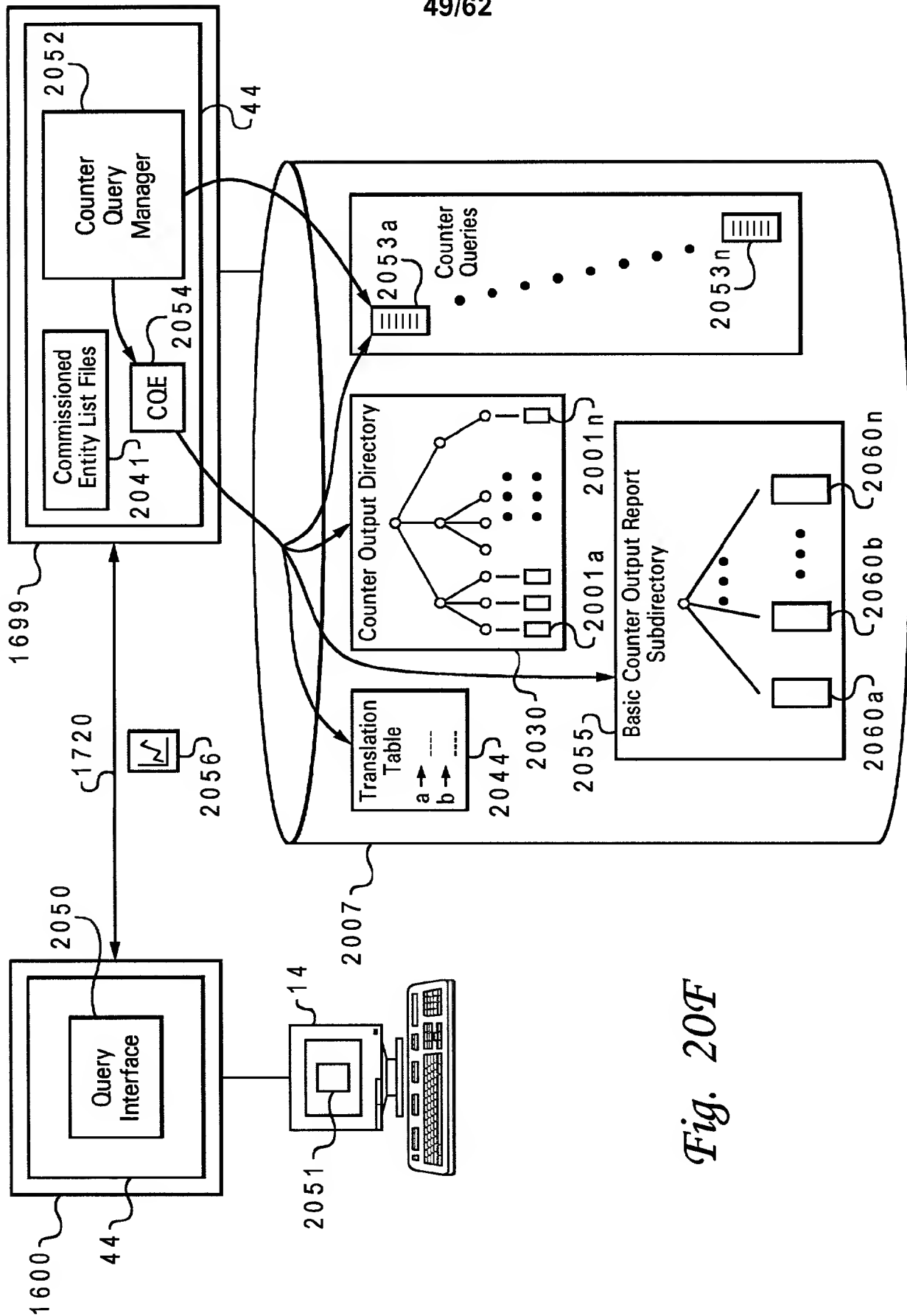
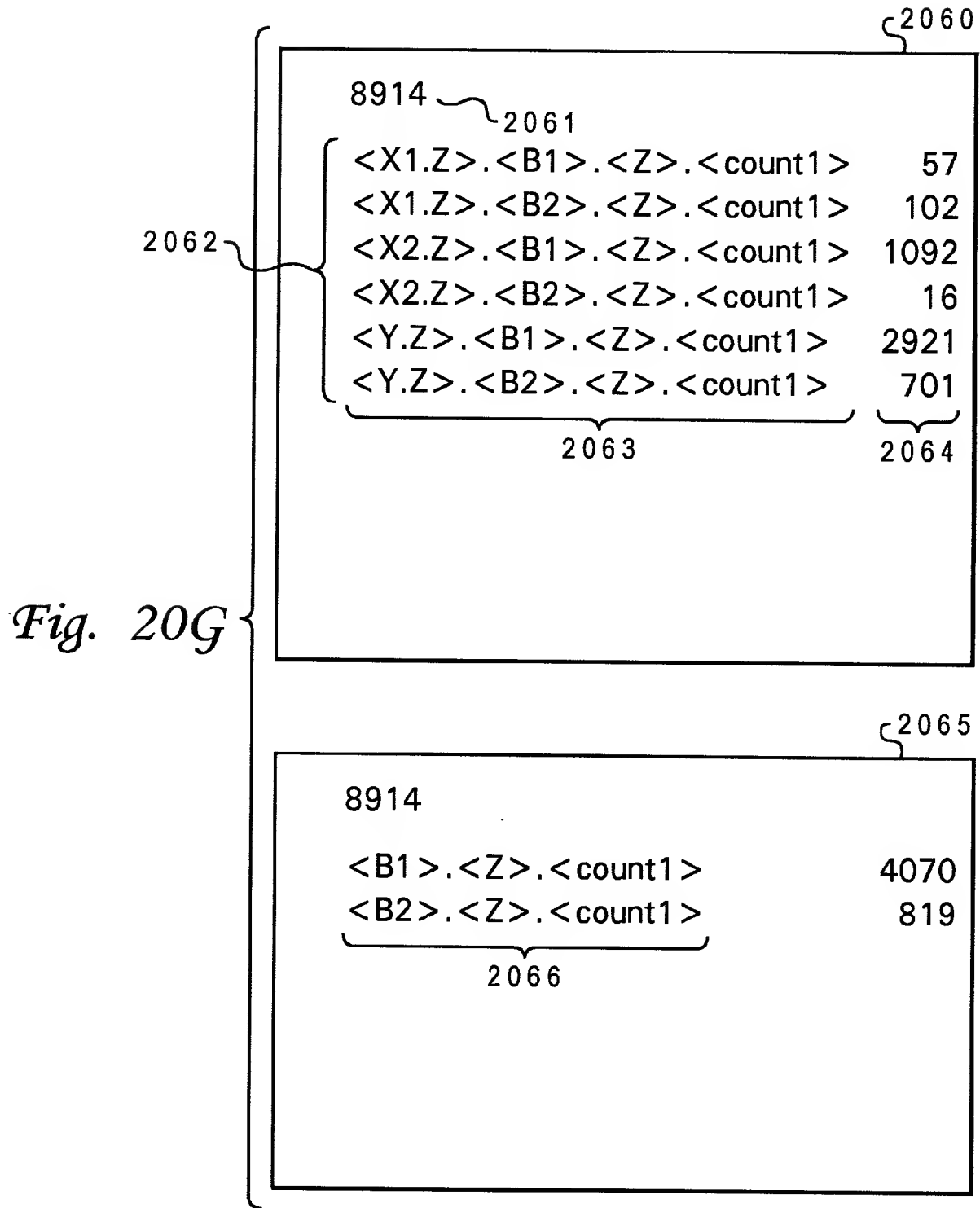


Fig. 20F

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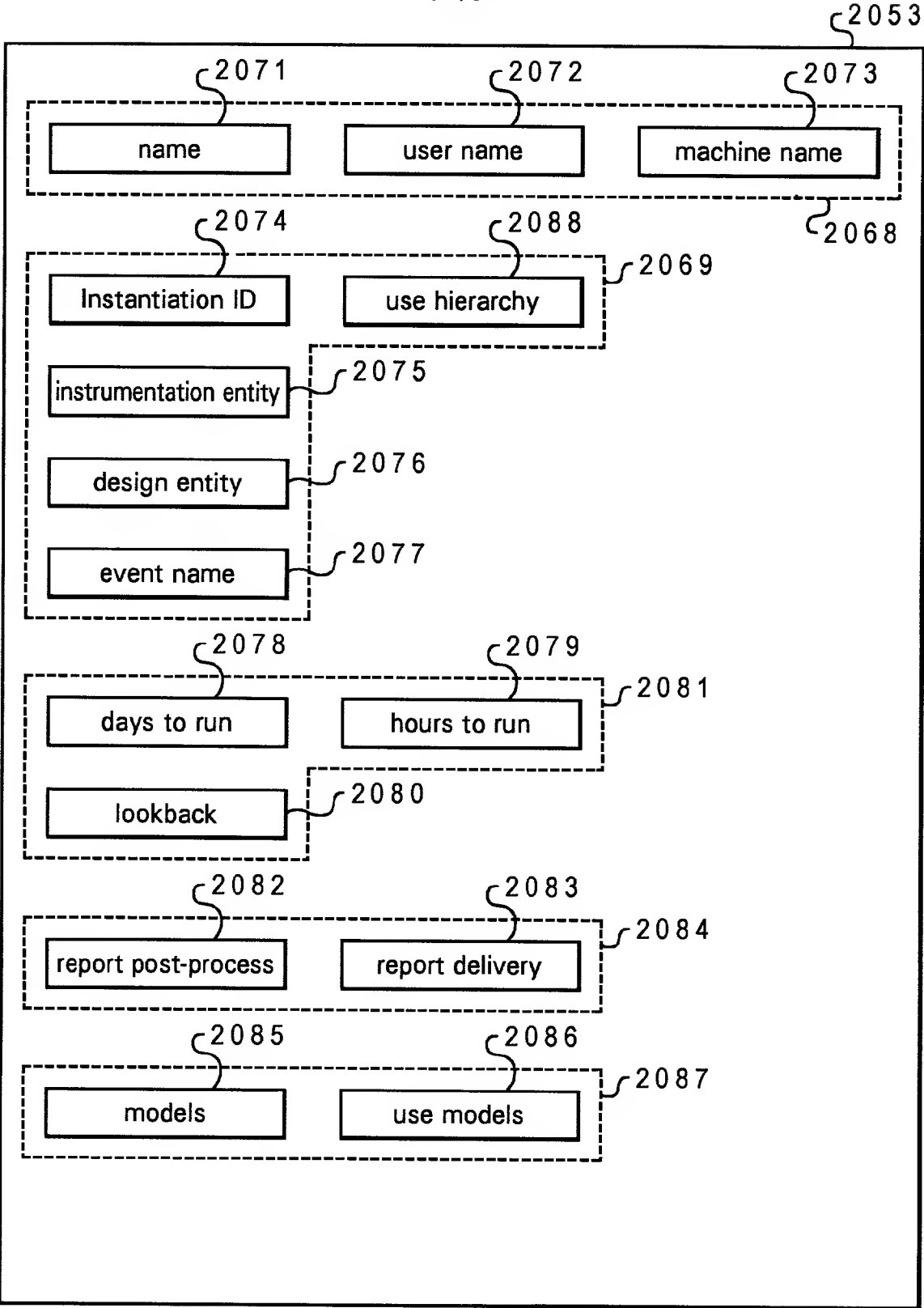


Fig. 20H

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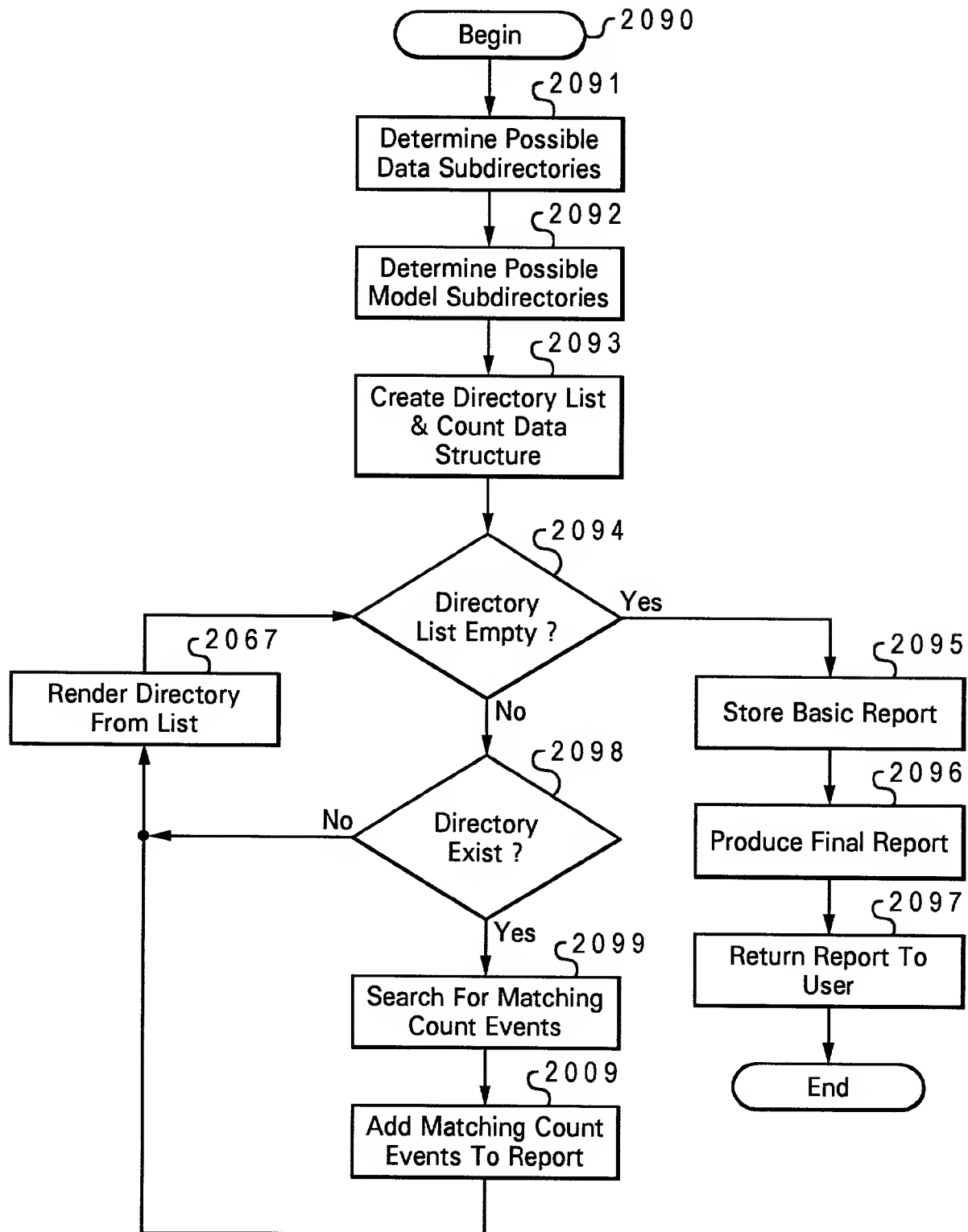


Fig. 20I

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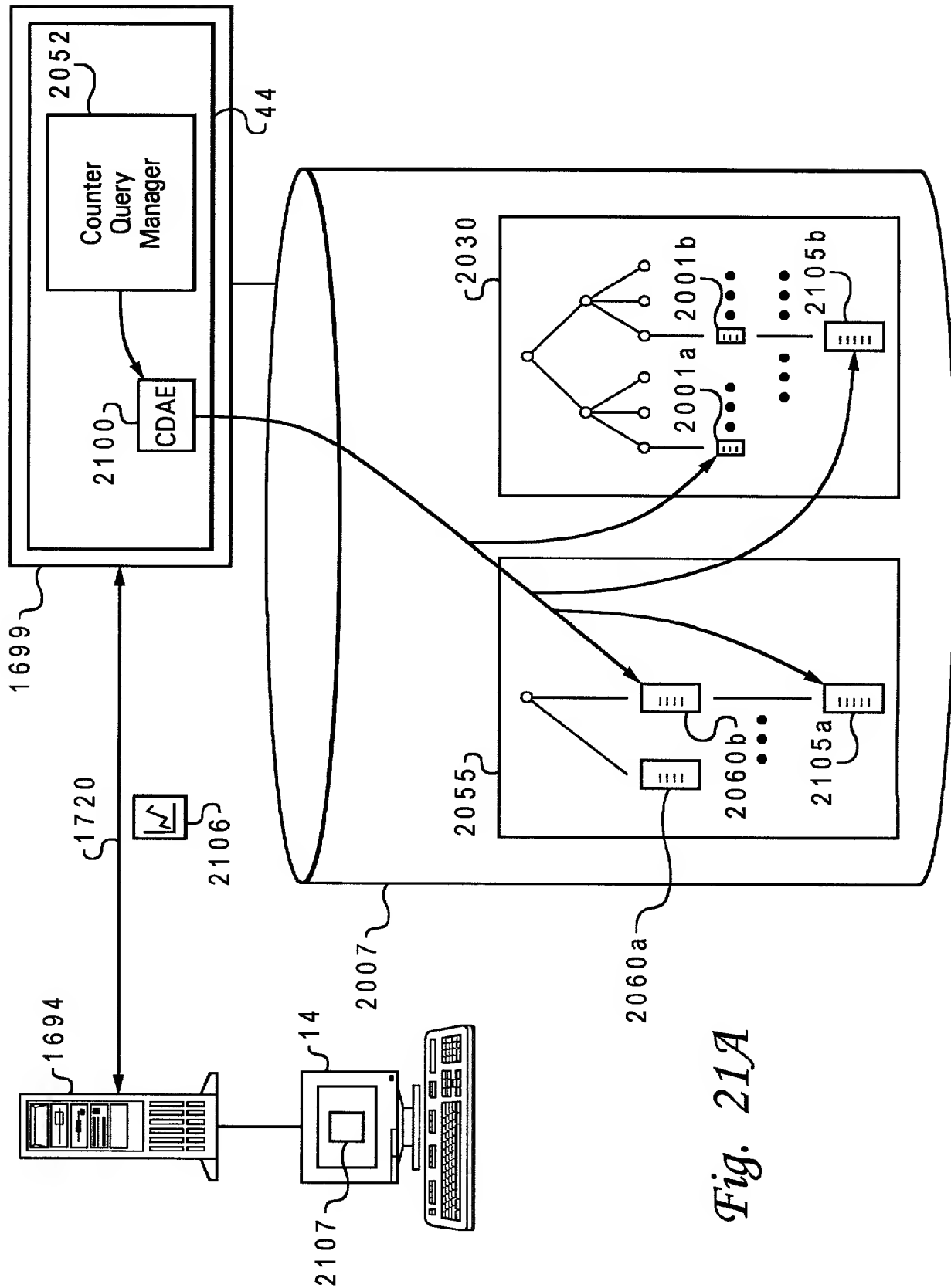


Fig. 21A

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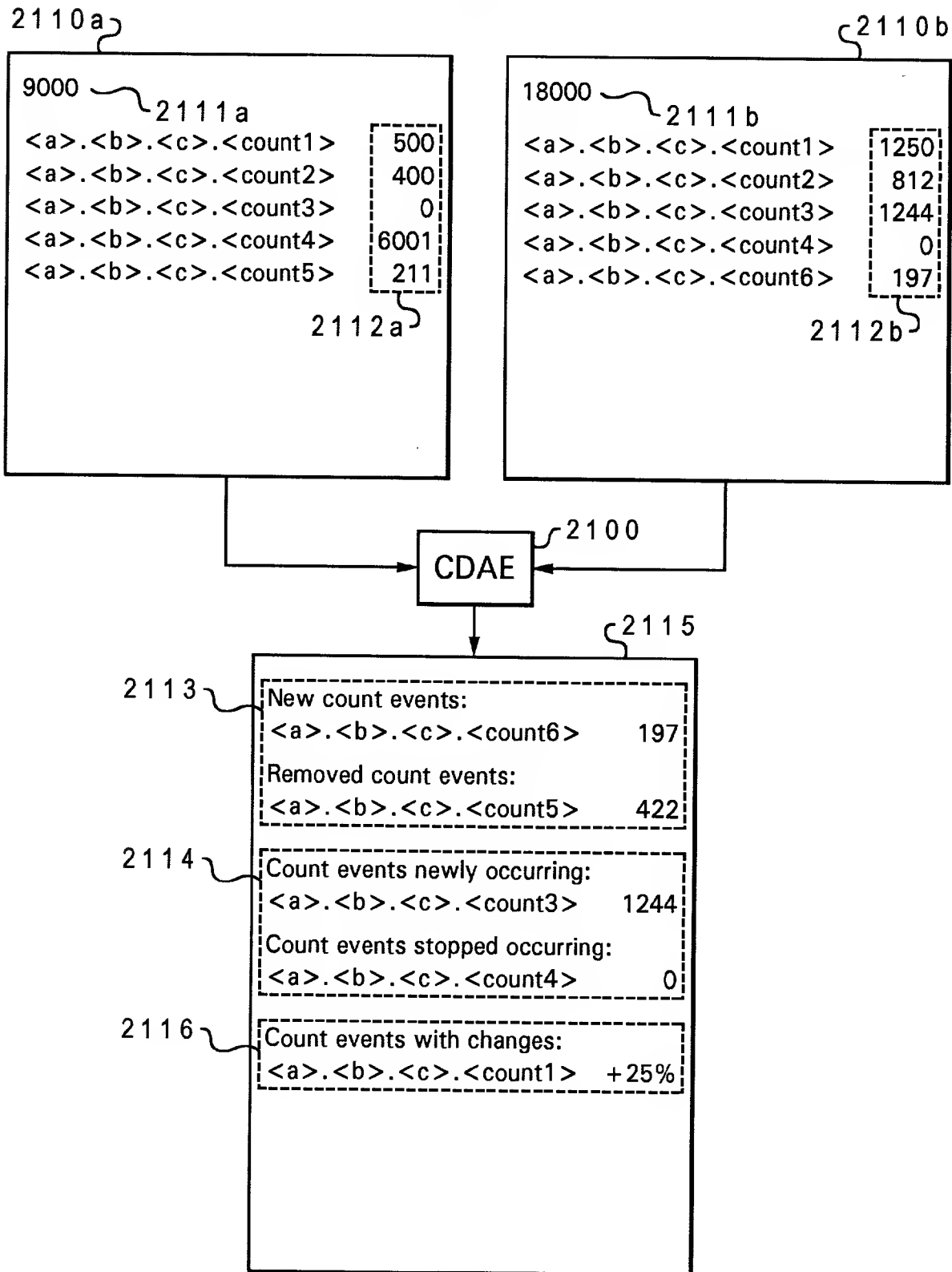


Fig. 21B

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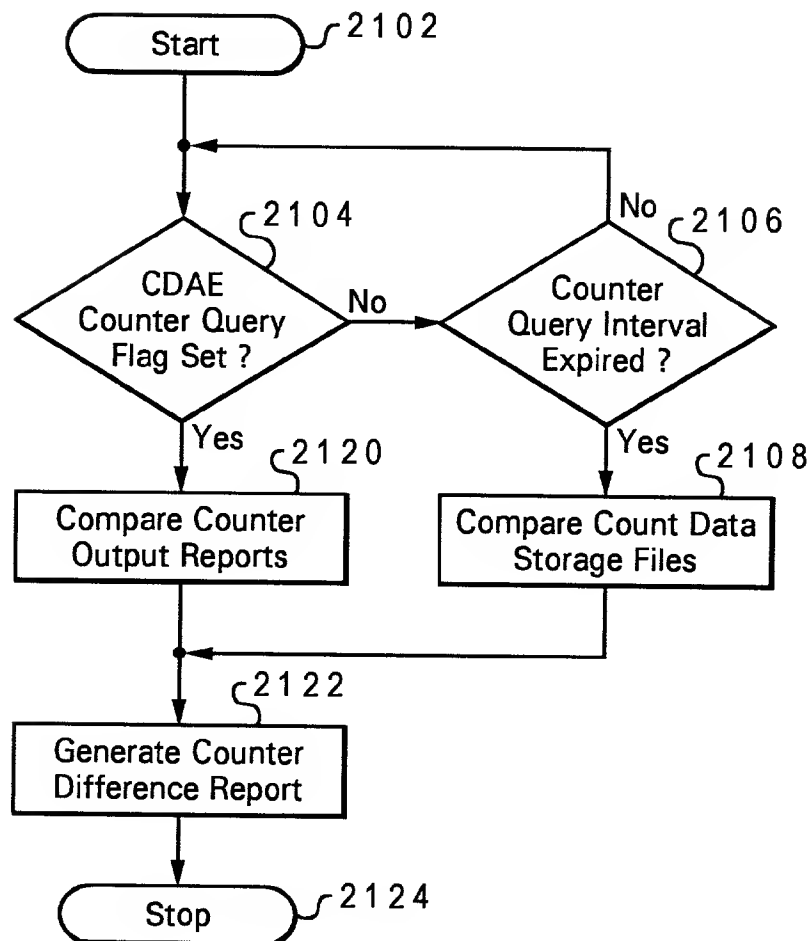


Fig. 21C

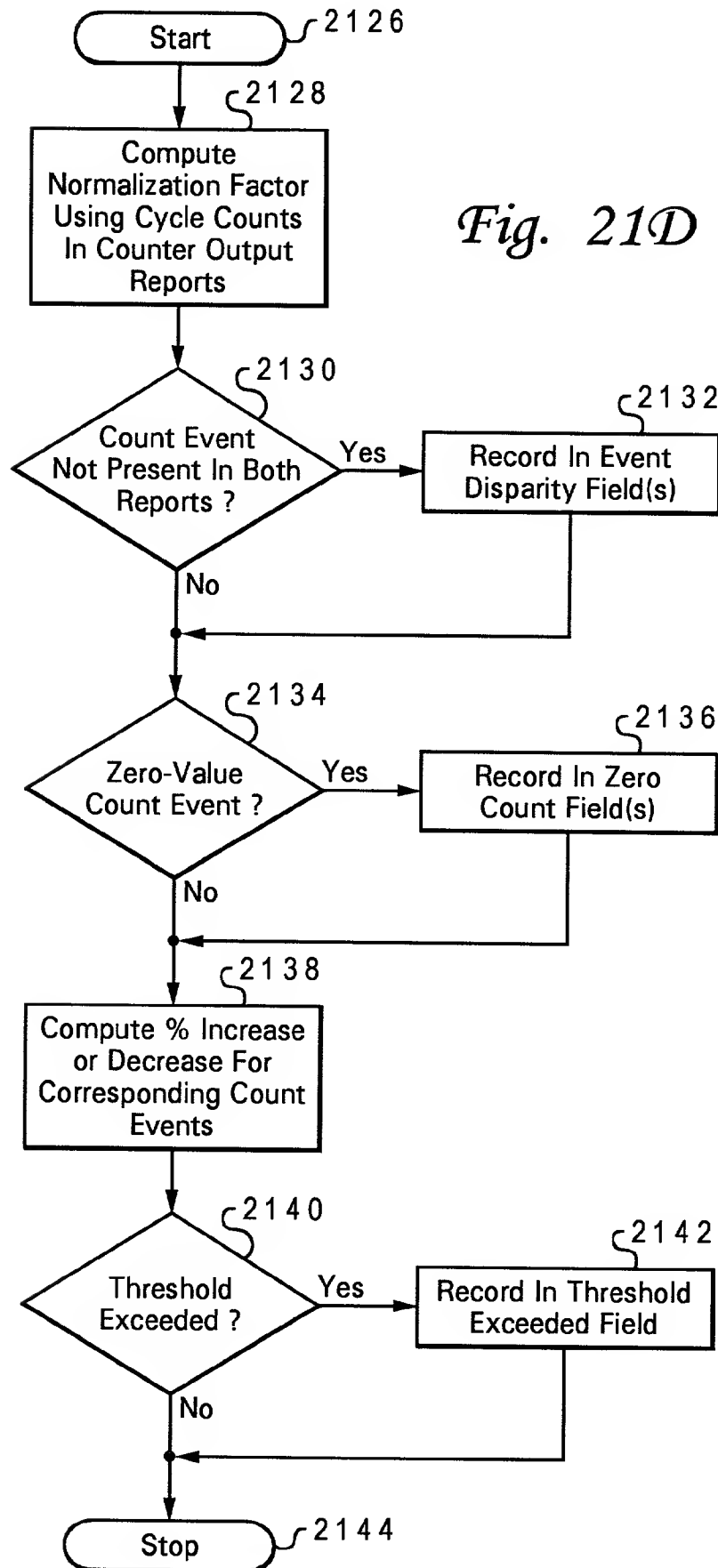
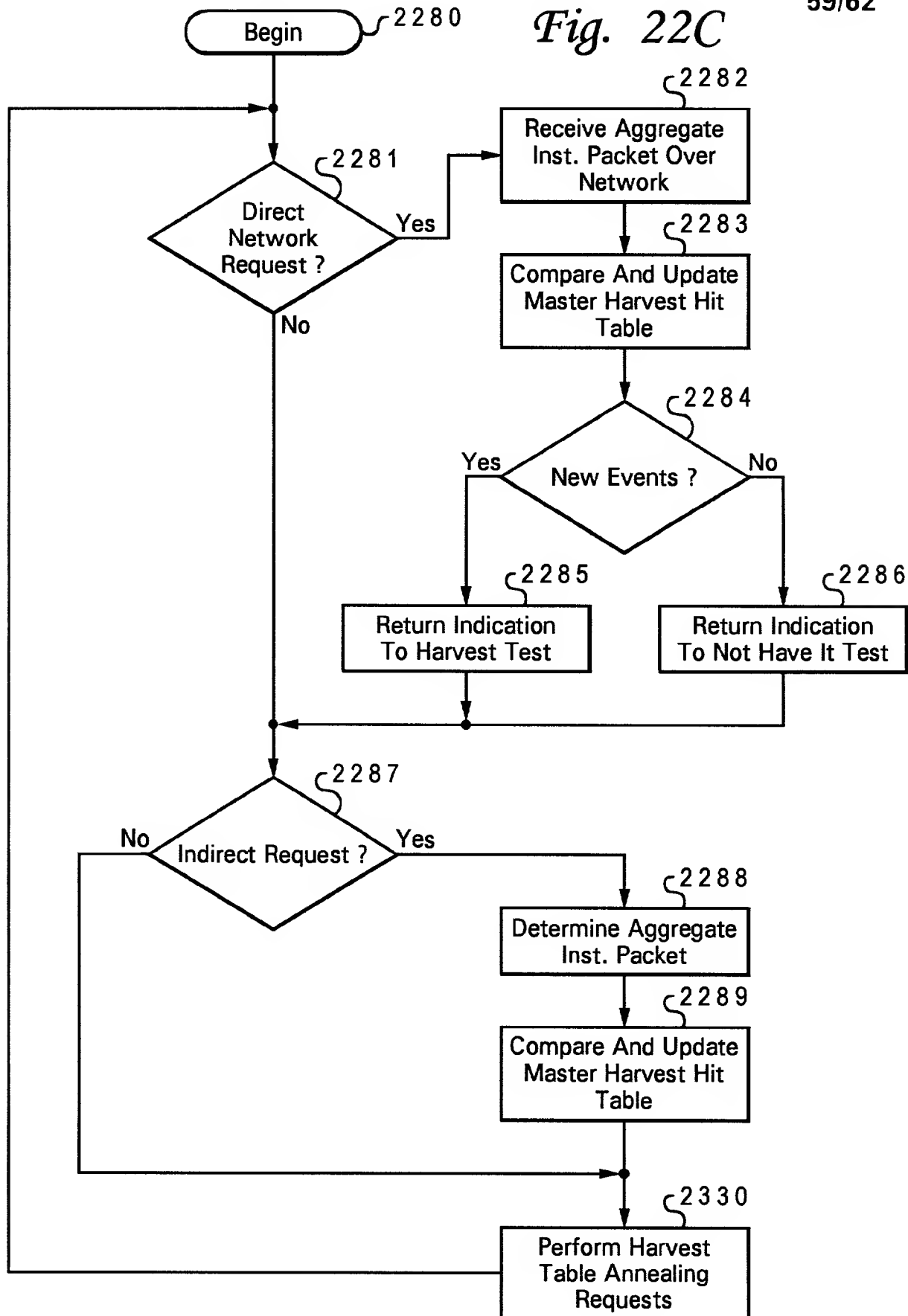


Fig. 22A

Variable	Mean	SD	Min	Max
Age	35.5	10.5	18	65
Gender	0.5	0.5	0	1
Marital status	0.5	0.5	0	1
Education	12.5	1.5	9	16
Income	15.5	5.5	10	25
Health status	0.5	0.5	0	1
Smoking status	0.5	0.5	0	1
Alcohol consumption	0.5	0.5	0	1
Exercise frequency	0.5	0.5	0	1
Stress level	0.5	0.5	0	1
Sleep quality	0.5	0.5	0	1
Work satisfaction	0.5	0.5	0	1
Life satisfaction	0.5	0.5	0	1
Overall health	0.5	0.5	0	1
Physical health	0.5	0.5	0	1
Mental health	0.5	0.5	0	1
Social health	0.5	0.5	0	1
Emotional health	0.5	0.5	0	1
Behavioral health	0.5	0.5	0	1
Environmental health	0.5	0.5	0	1
Occupational health	0.5	0.5	0	1
Financial health	0.5	0.5	0	1
Family health	0.5	0.5	0	1
Community health	0.5	0.5	0	1
National health	0.5	0.5	0	1
Global health	0.5	0.5	0	1
World health	0.5	0.5	0	1
Universal health	0.5	0.5	0	1
Human health	0.5	0.5	0	1
Planetary health	0.5	0.5	0	1
Ecological health	0.5	0.5	0	1
Environmental health	0.5	0.5	0	1
Climate health	0.5	0.5	0	1
Weather health	0.5	0.5	0	1
Seasonal health	0.5	0.5	0	1
Monthly health	0.5	0.5	0	1
Weekly health	0.5	0.5	0	1
Daily health	0.5	0.5	0	1
Hourly health	0.5	0.5	0	1
Minute health	0.5	0.5	0	1
Second health	0.5	0.5	0	1
Micro health	0.5	0.5	0	1
Nano health	0.5	0.5	0	1
Pico health	0.5	0.5	0	1
Femto health	0.5	0.5	0	1
Atto health	0.5	0.5	0	1
Zepto health	0.5	0.5	0	1
Yocto health	0.5	0.5	0	1
Xenon health	0.5	0.5	0	1
Krypton health	0.5	0.5	0	1
Argon health	0.5	0.5	0	1
Neon health	0.5	0.5	0	1
Helium health	0.5	0.5	0	1
Hydrogen health	0.5	0.5	0	1
Oxygen health	0.5	0.5	0	1
Nitrogen health	0.5	0.5	0	1
Carbon health	0.5	0.5	0	1
Sulfur health	0.5	0.5	0	1
Chlorine health	0.5	0.5	0	1
Fluorine health	0.5	0.5	0	1
Bromine health	0.5	0.5	0	1
Iodine health	0.5	0.5	0	1
Barium health	0.5	0.5	0	1
Strontium health	0.5	0.5	0	1
Calcium health	0.5	0.5	0	1
Magnesium health	0.5	0.5	0	1
Sodium health	0.5	0.5	0	1
Potassium health	0.5	0.5	0	1
Lithium health	0.5	0.5	0	1
Boron health	0.5	0.5	0	1
Aluminum health	0.5	0.5	0	1
Silicon health	0.5	0.5	0	1
Phosphorus health	0.5	0.5	0	1
Selenium health	0.5	0.5	0	1
Zinc health	0.5	0.5	0	1
Copper health	0.5	0.5	0	1
Iron health	0.5	0.5	0	1
Gold health	0.5	0.5	0	1
Silver health	0.5	0.5	0	1
Platinum health	0.5	0.5	0	1
Palladium health	0.5	0.5	0	1
Rhodium health	0.5	0.5	0	1
Ruthenium health	0.5	0.5	0	1
Rhenium health	0.5	0.5	0	1
Osmium health	0.5	0.5	0	



Fig. 22C



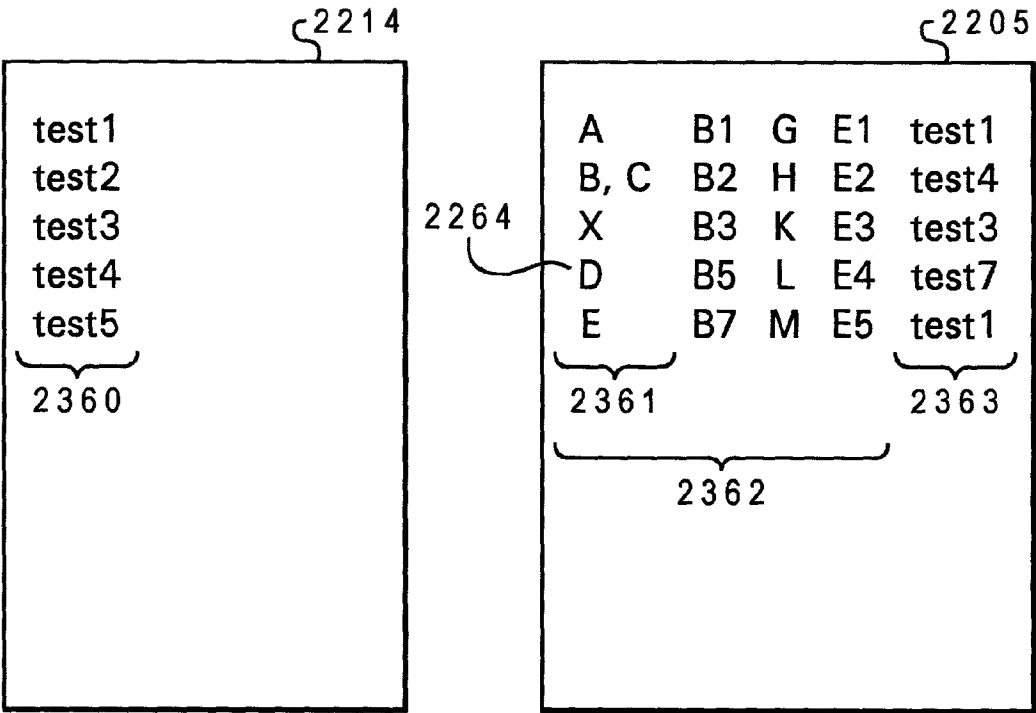


Fig. 23B

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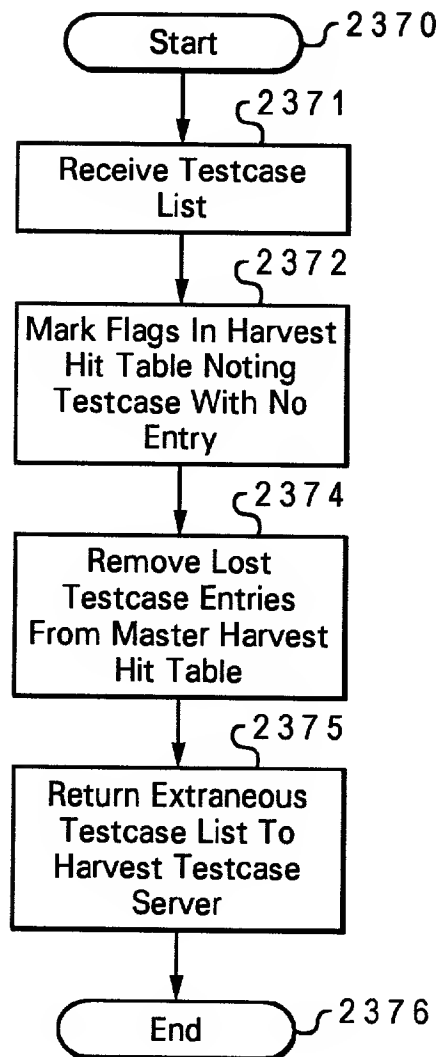


Fig. 23C